



**Independent Research**

Unabhängige Finanzmarktanalyse GmbH

## **Investment Research**

# **MOLOGEN AG**

**Market segment: General Standard  
Sector: Biotechnology**

**Initiation of Coverage**

**05/21/2007**

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# MOLOGEN AG <sup>4)</sup>

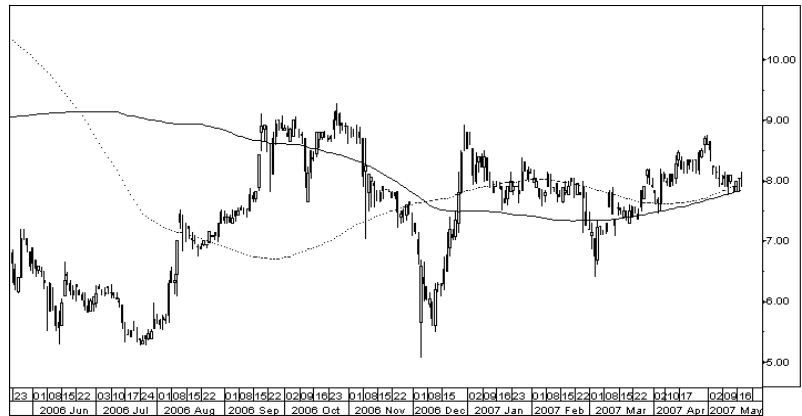
Buy  
before:

## Event:

Initiation of Coverage

## Recommendation:

Buy



<b>IR</b>	<b>2</b>	<b>2</b>	<b>3</b>
Rating	Growth	Investor Relations	Dependability

Authors: Björn Wolber (analyst),  
Dr. Kris Motmans (analyst)

- ⇒ **MOLOGEN has a proprietary, innovative technology against previously insufficiently treatable forms of cancer and infectious diseases, which is very well-tolerable in comparison**
- ⇒ **MOLOGEN's technology platform can be used in many ways in a broad range of application in oncology and in the area of anti-infectives, and thus clearly differentiates itself from single-indication products**
- ⇒ **Some of the indications addressed by the products based on the MOLOGEN technology have a very big market potential (over EUR1bn) - since the company lacks the funds required for independently making a product ready for marketing, MOLOGEN must enter into business partnerships with pharmaceutical companies**
- ⇒ **We have initiated our coverage of the MOLOGEN share - based on our valuation model (DCF model), we have calculated a fair value of EUR13.20 per share; our recommendation is Buy**

<b>MOLOGEN</b>		<b>Biotechnology</b>		<b>Performance (in %)</b>				
Country	GE	Fiscal year	Dec 31	Rel. 1 Month	-7.5			
Shares (m)	9.287	www.molgen.com		Rel. 3 Months	-9.3			
∅ Trading Volume	16,399	Last dividend	-	Rel. 6 Months	-13.1			
ISIN	DE0006637200	Payable day	-	Rel. 12 Months	-17.2			
Curr. Price (Xetra)	8.00 Euro	Market cap. (EURm)	74.3	Beta	1.5			
05/18/07 5:36 PM		Currency	EUR	Volatility (90 days)	42.1			
52W High	9.28	Date	10/26/06	CDAX	0.005%			
52W Low	5.10	Date	12/06/06					
Shareholders:	Absolute Capital Management Holding (22%), Ahead GmbH (6-7%), Prof. Dr. Burghardt Wittig (5%), Salvator Vermögensverwaltungs GmbH (9-10%), Free Float (61-63%)							
Investments:	VIVOTECNIA Research S.L. (Madrid/Spain)							
FY	Sales	EBIT	EBT	EAT	EPS	PER	EV/Sales 07E:	38.36
2004	2,093	-2,081	-2,051	-2,055	-0.39	-	EV/EBIT 07E:	neg.
2005	847	-4,052	-4,388	-4,394	-0.53	neg.	Dividend yield 06E:	-
2006	5,227	417	540	534	0.06	132.2	CAGR Sales 04-09E:	42.0%
2007E	1,650	-8,099	-7,999	-8,003	-0.88	neg.	CAGR EBIT 04-09E:	-
2008E	2,350	-8,150	-8,200	-8,204	-0.88	neg.	CAGR EAT 04-09E:	-
2009E	12,100	-11,087	-11,187	-11,191	-1.21	neg.		
Figures in EUR1,000 except EPS, hist. PERs based on average share prices								AS: IFRS

<sup>1)2)3)4)</sup> Please notice the advice regarding possible conflicts of interests as well as the disclaimer at the end of this document

## STRENGTHS

- **Proprietary, innovative technology in order to fight cancer and infectives with a comparably high tolerance**
- **Potentially treatable indications partly show a very high market potential**
- **Technology offers extensive possible applications/indications - no single-product group**
- **dSLIM with broad pre-clinic results (proof of concept shown in academic studies)**
- **Track record in marketing the cell-based gene therapy since 2006**
- **Financial resources to advance dSLIM CRC into phase III (assumption: no further R&D in other indications)**

## WEAKNESSES

- **As a result of the early stage of development so far none of the cancer-products showed clinical efficacy (proof of concept shown only in investigator-driven clinical trials)**
- **MOLOGEN is dependent on cooperations/licenses in the R&D segment (financial support) and in sales (know-how, execution)**
- **If the platform technology does not prove effective, the business model is not sustainable**
- **Future necessary raising of capital is dependent on the general stock market situation and the special sentiment of the MOLOGEN share**

## OPPORTUNITIES

- **Extraordinary high earnings potential if the drugs' effectiveness can be proved for diseases that are insufficiently treatable, if they the drugs are approved**
- **Closure of further marketing agreements of the cell-based gene therapy of cancer (potential up-front payments, milestone payments, royalties)**
- **EMEA approval of the cell-based gene therapy (dSLIM/MIDGE for treating renal cell carcinoma (RCC)) and/or EMEA approval / licensing agreement for dSLIM for treating colorectal carcinoma (CRC)**
- **Individual marketing of the dSLIM molecule to pharmaceuticals groups (renders the extension of the product life cycle possible, amongst others, for BigPharma)**
- **Approval of the leishmaniasis vaccine (vet; MIDGE-TH1) and resulting royalty taking**

## THREATS

- **Delay in the development and approval of pipeline products**
- **Treatment authorisation of the cell-based gene therapy is not granted (Asia, India) or existing contracts are terminated - leads to missing follow-on payments (royalties, milestones) of concluded contracts**
- **Liquidity risk if future sales proceeds stay away and share capital and financing via external funds is not possible (worst-case scenario)**
- **Country-related risk (imponderability of business relations with groups from emerging markets, India, Asia, Arab region, amongst others)**

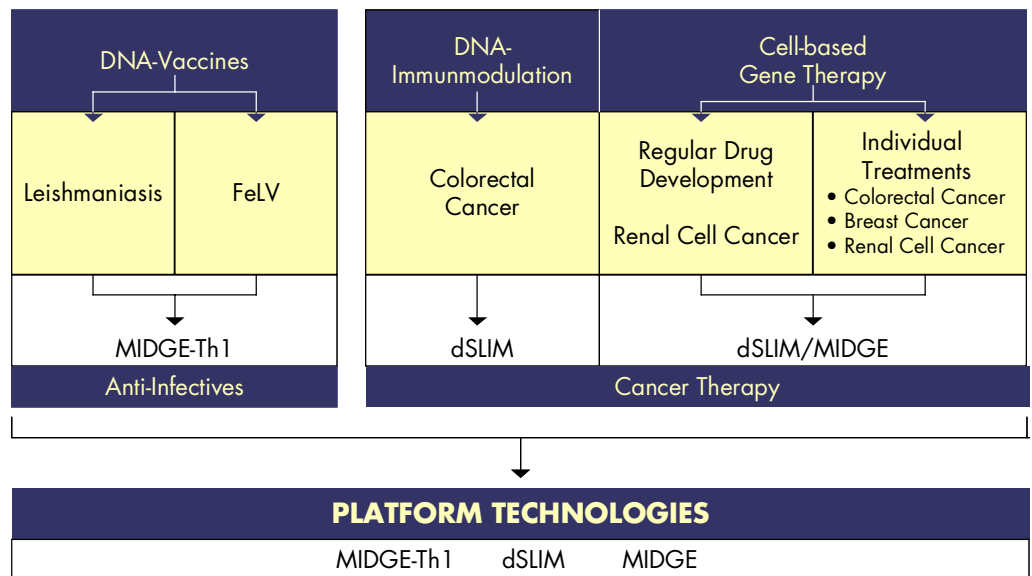
**Corporate profile**

*Development of novel products to treat cancer and infectives*

MOLOGEN is a biotechnology group based in Berlin, which is specialised on treating diseases, which have not been treatable or insufficiently treatable so far of the indication areas cancer and infectives (animal and human being). In particular, MOLOGEN develops DNA-based vaccines and therapeutics aimed at prophylaxis and treatment. The therapies' basis are two patented technologies developed by MOLOGEN itself: **MIDGE** (Minimalistic Immunologically Defined Gene Expression) and **dSLIM** (double Stem Loop Immuno Modulator). Both technologies have in common that they make use of DNA structures (desoxyribosenucleic acid, which contains genetic information of all creatures), which are used as drug in the therapy. MIDGE works as gene transfer, which differs from other vectors (viral vector, plasmid vectors, amongst others) due to its small size and a very high specificity of genetic information and which shows a very high security and efficiency as was proved by studies. In the Anti-Infectives segment, MIDGE is a basis for a DNA vaccine (MIDGE-TH1), producing a specific cellular and humoral immune reaction against viruses, bacteria or parasites and destroying those. dSLIM is a DNA-based immune modifier and TLR9 agonist developed by MOLOGEN, which activates the immune system and thus causes a natural defence reaction to cancer cells.

The use of dSLIM and MIDGE takes place individually or in a combined way depending on the field of therapy.

*Platform technologies*



Source: MOLOGEN AG

Currently, 52 people are employed in the group. 36 of them in Research & Development, 14 in administration as well as two apprentices and temporary personnel. MOLOGEN holds roughly 89.8% in the Spanish subsidiary VIVOTECNIA Research, primarily developing order trend in the segments toxicology, pharmacology and biomedical sciences.

<sup>1)2)3)4)</sup> Please notice the advice regarding possible conflicts of interests as well as the disclaimer at the end of this document

## Management

**Prof. Dr. Burghardt Wittig (CEO)** is co-founder and chairman of MOLOGEN. The scientist achieved numerous awards and is the author of over 100 publications. He is responsible for Research and Development at MOLOGEN. Professor Wittig holds the university chair for molecular biology and bioinformatics at Berlin Charité.

**Dr. Matthias Schroff (COO)** is a renowned scientist and long-standing employee of MOLOGEN. Dr. Schroff is the co-inventor of numerous patented technologies at MOLOGEN. As a graduate biochemist, he started as senior scientist and managing director of MOLOGEN GmbH and has enjoyed a close academic working relationship with Professor Wittig since his university studies.

**Jörg Petraß (CFO)** has worked for several years in executive positions at MOLOGEN as an authorised signatory in the administration and the finance and accounts departments. He combines detailed knowledge of MOLOGEN's business with extensive expertise in the organisation of contracts specific to this sector as well as many years of experience in accounting and in all the rules and regulations governing the capital markets.

## Supervisory board

The supervisory board consists of three people. Dr. Mathias P. Schlichting, lawyer (Hamburg) is co-founder of MOLOGEN AG and is the head of the supervisory board. Further members are Gregor Kunz, auditor and accountant (Berlin) and Prof. Dr. Hans Lutz, professor (Zurich).

## Group history

- 1998**
- Foundation of MOLOGEN AG
  - IPO
- 2000**
- Foundation der Vivotecnia Research S.L. (formerly named: Mologen Molecular Medicines S.L.)
  - MIDGE-Patent (Germany)
  - Capital increase: gross proceeds: EUR12.5m
- 2002**
- MIDGE-Patent (USA)
  - Segment change of the MOLOGEN-share to „Geregelter Markt“
- 2005**
- dSLIM-Patent (USA)
  - MIDGE-TH1 Patent (Europe)
  - Capital increase: gross proceeds: EUR9.2m
- 2006**
- MIDGE-Th1-Vaccine againsts Leishmaniasis - Licence and Cooperation agreement with major US animal health company
  - Orphan Drug Status (EMA) for Cell-based Gene Therapy of RCC
  - MIDGE vector wins „Frost & Sullivan’s 2006 Technology Innovation of the Year Award“
  - Cell-based Gene Therapy against Cancer – Agreement for licensing and distribution in Asia
  - Cell-based Gene Therapy against Cancer – Agreement for licensing and distribution in India

Source: MOLOGEN AG

## Shareholder structure

Shareholder Structure		
Shareholder	pre capital increase	post capital increase (as of 03/15/07)
Absolute Capital Management Holding	15.62%	22.00%
Ahead GmbH	7.18%	6% - 7%
Prof. Dr. Burghardt Wittig	5.09%	5.00%
Salvator Vermögensverwaltungs GmbH	5.01%	9% - 10%
Free Float	67.10%	61% - 63%

Source: MOLOGEN AG

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## Corporate strategy

### R&D and out-licensing

MOLOGEN's corporate strategy exceeds the pure researching and developing activity. Currently, the group is focusing on further developing the products of its product range (dSLIM, MIDGE), however, plans concerning marketing and licensing have already been completed. Since the end of 2006 MOLOGEN has got a track record in the licensing segment at its disposal.

Technology/Product	Partner	Date	Licence Agreement
<b>MIDGE-T<sub>H</sub>1</b>	US-Pharma Company (identity undisclosed)	04/2006	Research and development, collaboration and license agreement Payments: Initial payment of EURO.1m upon execution of the agreement, future payments for milestones achieved, and a royalty on sales
<b>Cell-based Gene Therapy</b>	C.I.P. (China)	11/2006	Licensing and distributing of the innovative cell-based gene therapy in Asia Payments: EUR2.1m upfront; further milestone payments of up to EUR1.7m and additional license payments
<b>Cell-based Gene Therapy</b>	ONCO Life Sciences (India)	12/2006	Licensing and marketing of the innovative cell-based gene-therapy for India Payments: EUR2.1m upfront; plus other payments due to purchases of all individualised therapy components for patients in India (separate purchase and supply agreement)

Source: MOLOGEN AG

Thus, the corporate strategy is based on a two-pillar model, comprising the independent further development of products on the one hand, and the evaluation of possible licensing out agreements on the other hand. Particularly in order to generate the required earnings and to share the R&D risks with major partners, licensing out is important for MOLOGEN. Referring to the individual research products and the corresponding therapy procedures (subject to application of the respective platform technologies) the strategy shows a differentiated picture.

### Strategy: dSLIM

Plans for the **cancer therapy** with **dSLIM** foresees to continue the current colorectal carcinom study on its own as long as possible in order to postpone licensing out to a later stage (optimum until the approval) and thus to be able to conclude a possibly lucrative licensing out contract. Major pharmaceutical groups are the target partners for a future licensing out. Moreover, MOLOGEN can imagine to license out dSLIM individually as molecule to special pharmaceuticals groups, which might increase the effectiveness of their own tumour drugs in connection with dSLIM and thus might achieve a new patent protection (as a result of considerable modifications; extension of the product life cycle).

### Strategy: dSLIM/MIDGE

The strategy for the **cell-based gene therapy (dSLIM/MIDGE)** plans studies relevant to the approval in Europe (EMEA) on the one hand, and at the same time to make use of the technology in treating patients in countries where the individual treatments within compassionate use (treatment of patients with still not approved drugs outside clinical studies) are not quantitatively limited (Asia, India, amongst others). In 2006, MOLOGEN was able to show that this way can be successful for the first time by means of two closed licensings (China and India). According to group information, currently MOLOGEN is negotiating with other potential partners (from Eastern Europe, amongst others). Strategically, this concept of premature licensing out into unregulated markets is very

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important for MOLOGEN. On the one hand, significant earnings can be harvested already before the regulatory market approval, which might be used for further developing the pipeline. On the other hand, the treatments lead to important data about the effectiveness, use and safety, which could be beyond the results gained through clinical studies. The therapy authorisation as precondition for treating patients for China and India, referring to both license contracts, is still expected this year.

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*Strategy: MIDGE-TH1*

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The **Anti-Infectives (MIDGE-TH1)** segment, which falls slightly behind the two therapy methods as far as priority is concerned, is to be developed further, too, in the medium-term. We consider this segment interesting as on the one hand, it has a lot in common with MOLOGEN's cancer projects and on the other hand it has to do with another field of therapy so that MOLOGEN is broadly positioned here. MOLOGEN plans to focus clearly on research and development of highly-innovative DNA-based biopharmaceuticals and therapies for diseases, which have not been treatable or insufficiently treatable so far. In the near future, cooperations and licensing out are planned here, too.

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*No plans for independent marketing/sales*

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MOLOGEN considers itself a pure research and development group. Hence, the corporate strategy does not see independently marketing the products as this requires a high sales know-how and is very capital-intensive.

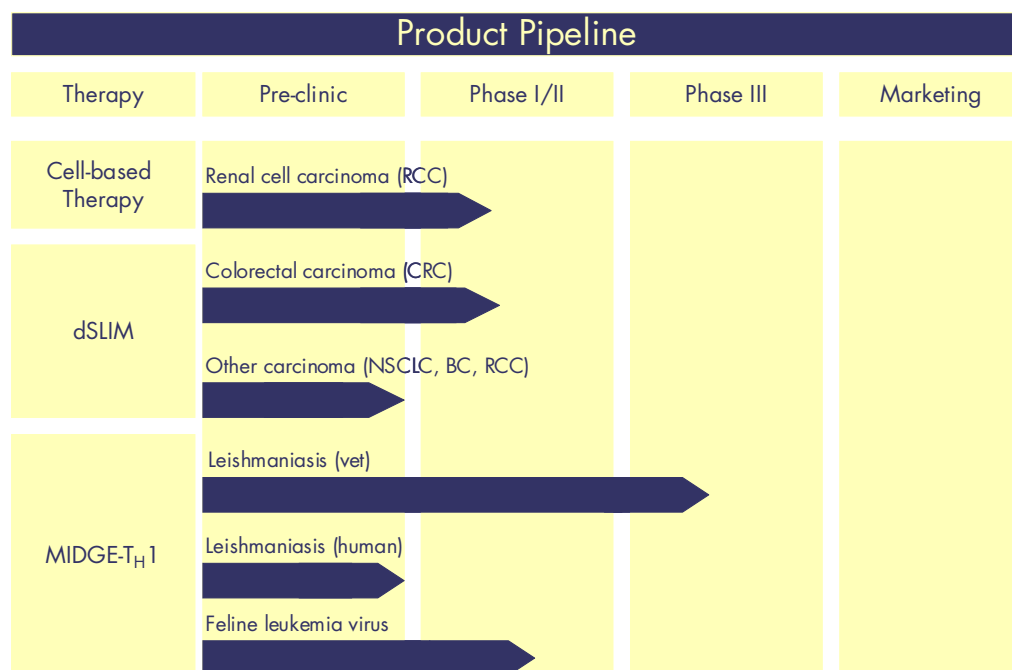
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*Partnership with Big Pharma necessary*

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The view to the financial situation of MOLOGEN shows that the important studies (CRC with dSLIM, RCC with dSLIM/MIDGE, amongst others) can currently not be executed by the group's own financial power until the readiness for marketing. For this reason, MOLOGEN will try to enter partnerships with groups of the pharmaceuticals segment in order to receive the necessary financial support and thus to increase prospect of success for an approval. In our opinion, cooperations in the segment of MOLOGEN's cancer products will only become scientifically interesting in case of successful results of the phase IIa (proof of clinic effectiveness). Moreover, the past development in the biotech segment showed that large pharmaceutical groups require at least to see this proof of concept before a cooperation is concluded. Generally, we consider the strategy of licensing out necessary in an economical point of view and strategically coherent. Hence, MOLOGEN will reach the necessary financial room for manoeuvre and a split of risk, however, at the same time it gives away a part of earnings opportunities.

## Pipeline and current studies



Source: MOLOGEN AG

### Study: dSLIM CRC

Currently, MOLOGEN is developing a dSLIM-based active agent for the indication colorectal carcinoma (CRC). The so far results of the investigator-driven clinical trials (not relevant for the approval) suggest a very good tolerance and an increase of the effect of conventional chemotherapeutics. Thus, in a study comprising 24 patients it was shown that by giving dSLIM for the treatment of metastasising colorectal carcinoms the median overall survival rate at least tripled in 15-20% of the patients.

As a result of the lacking relevance for approval (investigator-driven clinical trials), MOLOGEN will carry out two new trials (phase Ia and phase IIa), which the group plans to start this year. After completing phase I and II studies MOLOGEN can directly enter the Phase(s) III trial(s) relevant for the approval. The other indications for dSLIM (NSCLC, BC and RCC) are still preclinical, but are planned to move to phase I and II after positive results from the lead study dSLIM CRC.

### Study: dSLIM/MIDGE RCC

For the cell-based gene therapy, the study concerning the renal cell carcinoma (RCC) is the pilot study. In 2007 MOLOGEN plans to start a phase I/II trial regarding this. Parallely, step by step first clinical studies are to be prepared for further indications (breast, colon and lung cancer). In an academic study with 17 patients concerning the treatment of renal cell carcinoma (RCC) MOLOGEN was able to show that the median overall survival rate (at least) tripled in 30-40% of the patients.

<sup>1)2)3)4)</sup> Please notice the advice regarding possible conflicts of interests as well as the disclaimer at the end of this document

In the long-term, the cell-based gene therapy could receive an EMEA approval. The fact that EMEA supports the development of the cell-based gene therapy became clear in the past fiscal year 2006, when the group was granted the Orphan Drug Status for the indication renal cell carcinoma. In case of a successful approval this will secure MOLOGEN a 10-year exclusive marketing right and financial support by EMEA in the approval procedure.

We consider the license agreement concluded for the cell-based gene therapy a major gain for the R&D activity. The analysis of the treatment results within the "Compassionate-Use" programme in India and China might deliver additional important information, which are not relevant for the EMEA approval, however, they flow into the following studies as experience.

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#### *Study: MIDGE TH1*

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The planned phase III trial regarding the leishmaniasis vaccine in the Anti-Infectives segment will be carried out by a large US pharmaceutical group (company name undisclosed due to contractual reasons). MOLOGEN paved the way for this in 2006 by licensing out the DNA vaccine (MIDGE TH1) for treating leishmaniasis in an animal. The group expects the approval within the next 18 months so that in 2009 or 2010 marketing might be started.

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#### *Other planned studies (anti-infectives)*

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For the corresponding vaccine counterpart for human beings (leishmaniasis, human) plans for starting the preclinical development in 2007 came up. Depending on granted subsidies (WHO, Gates Foundation, amongst others) a start of clinical studies at the end of 2007/08 seems possible. If no subsidies are raised, MOLOGEN will not continue the development due to economical reasons.

According to group information, the development of the vaccine against cat leukaemia started again, as a pharmaceutical group showed its interest. The further development of the vaccine will depend on a possible cooperation or licensing out.

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#### *Current study-program*

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Studies	Type	Primary Endpoint	Patients	Start
<b>Cell-based Therapy</b>				
<b>- Renal cell carcinoma (RCC) -</b>	Phase Ib	tolerability, pharmacokinetics and immune	20	2007E
	Phase II	proof of concept	80-100	2008E
	Phase III	efficacy / time to progress	300-400	2009E
<b>dSLIM</b>				
<b>- Colorectal cancer (CRC) -</b>	Phase I	tolerability, pharmacokinetics and immune	24	2007E
	Phase II	proof of concept	300	2007E
	Phase III	efficacy / time to progress	600-700	2009E
	EMEA Filing			2011E
	Market Launch			2012E
<b>MIDGE-T<sub>H</sub>1</b>				
<b>- Leishmaniasis (vet) -</b>	Phase III	Optimisation of dosis		2007E
	EMEA Filing			2008E
	Market Launch			2009/10E

Source: MOLOGEN AG

## Patents

### Secured IP-situation

According to our estimate, MOLOGEN has got a secured IP situation as far as basic technologies (dSLIM and MIDGE) are concerned. Moreover, on the basis of the technologies further patents for the aimed use in certain indications can be granted leading to a new patent protection, exceeding the duration of a patent of the basic technologies.

Product	Patent	Patent Protection (Countries)	Expiry Date
<b>dSLIM</b>	Covalently closed Nucleic Acid Molecules for Immunomodulation	EU USA	2020 2020
<b>MIDGE</b>	Design Principle for construction of expression constructs for gene therapy	EU USA	2017 2019
<b>MIDGE Maker</b>	Method for making linear, covalently closed DNA constructs	EU USA	2019 2020
<b>SmartMIDGE, Th1-Th2</b>	Instrument to improve the immune reaction	EU	2022
<b>Leish p36</b>	DNA expression construct for treatment of leishmaniasis-infections	EU	2022
<b>FeLV</b>	Vaccine against infections from oncovirus (such as Feline Leukemia Virus of cats)	EU	2023

Source: MOLOGEN AG

As to patents, MOLOGEN is in principle royalty-free. According to the employees' inventor law, the inventor is entitled to sales proceeds generated as a result of the inventions. Those sales proceeds are not significant, in our opinion.

## MOLOGEN's immune based therapeutics platform

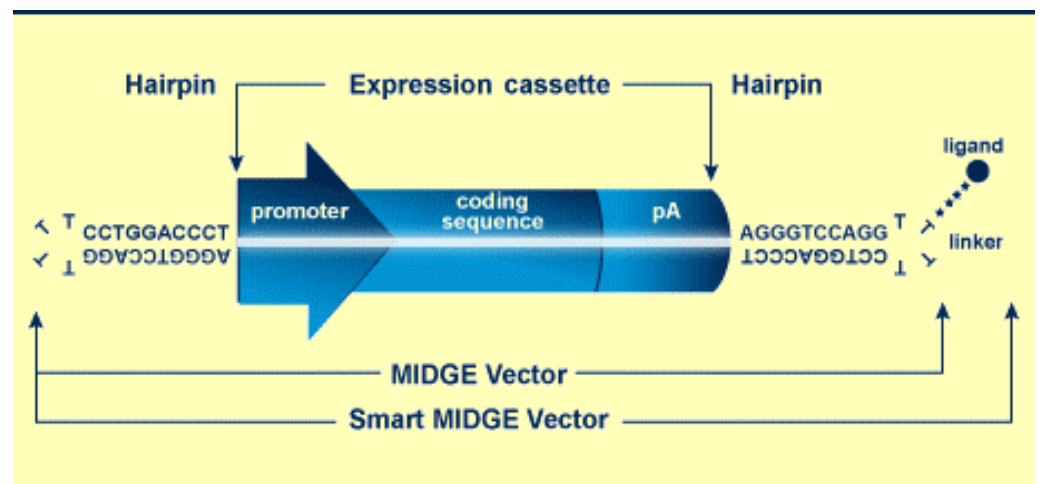
The core of MOLOGEN's technology platform for the development of therapeutic vaccines is formed by the combination of two proprietary technologies: **MIDGE**, a gene transfer construct and **dSLIM**, a DNA based immunomodulator.

### MIDGE

#### MIDGE - DNA transfer

MIDGE (Minimalistic Immunogenically Defined Gene Expression) is a vector for DNA transfer into cells. The MIDGE DNA vector can be used to genetically modify cells in vitro by transferring genes of interest into a target cell. The MIDGE vector can also be applied in vivo as a DNA vaccine. DNA vaccines are a relative novel and powerful method for vaccine delivery, which involve the introduction into tissues of a DNA plasmid carrying an antigencoding gene that transfects cells in vivo and results in an immune response. DNA vaccines have several distinct advantages, which include ease of administration, use of a generic technology, simplicity of manufacture, and chemical and biological stability. As they are delivered to and expressed from within host cells, they are also capable of inducing both humoral (antibody) and cellular (T-cell) immunity.

The MIDGE vector technology differs substantially from other vector systems such as plasmids and viruses in that it contains the information necessary for the actual action. Most traditional vector systems are produced as circular, double stranded DNA molecules that contain besides the expression cassette (the gene of interest and flanking sequences that regulate the expression of the gene of interest) a series of other structures necessary for vector production (selection markers), packaging (in case of viral vectors) or sequences for integration. The MIDGE vector consists of a linear piece of DNA, covalently closed by single-stranded hairpin structures at both ends. The expression cassette can hold DNA sequences ranging from 800 to more than 8000 base pairs.



Schematic representation of the MIDGE Vector System

Source: MOLOGEN AG

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### *MIDGE advantages*

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The vector only contains the necessary sequence elements needed for gene expression in a target cell and does not contain any medically irrelevant or potentially dangerous sequences which makes them more than 50% smaller than plasmid vector system. The MIDGE vector technology has been expertly engineered to overcome the disadvantages that other gene transfer and expression systems exhibit in efficacy and safety.

The MIDGE vector system has demonstrated a superior profile for DNA delivery in the sense that the vector:

- is non-toxic;
- does not induce any inflammatory reaction;
- does not integrate into the host's genome;
- does not contain any "garbage" sequences;
- efficiently transfers the gene of interest
- is easy and cheap to produce, using standardised, scalable and controllable laboratory techniques;
- can be tailored or engineered to target specific cell types.

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### *Conclusion*

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The versatility and modularity of the MIDGE vector system combined with the excellent safety and efficiency allow these vectors to enter a cell safely and efficiently to carry a DNA sequence (message) into a human body cell that will trigger/cause a strong immune response to fight or prevent infectious disease or cancer.

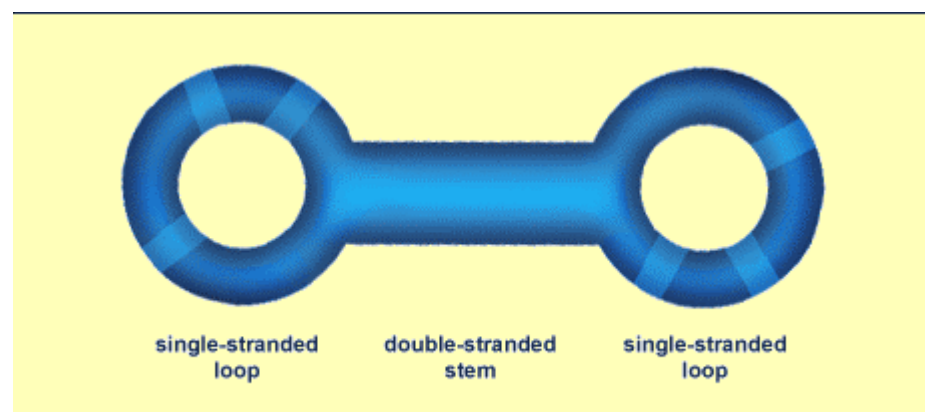
### **dSLIM**

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### *dSLIM - DNA molecule*

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dSLIM (double Stem Loop Immuno Modulator) is a "dumbbell" like DNA molecule with a stem of 28 base pairs flanked by two loops of 24 to 28 nucleotides. dSLIM molecules are considerably smaller and consist only of non-coding DNA. The DNA is not chemically modified.



Graphical representation of a dSLIM molecule

Source: MOLOGEN AG

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*dSLIM regulates immune response ...*

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These immunomodulatory molecules have been developed by MOLOGEN to regulate the immune response in a targeted way against viruses, tumour cells or bacteria. Depending on its structure and sequence, dSLIM is capable of eliciting this response.

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*...by activating TLR9*

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The immunomodulatory mechanism of action is mediated through the activation of TLR9, one of the ten human TLR's that have been identified to date. TLRs have become attractive targets for developing immune modulators to treat a number of diseases including cancer, asthma, allergies, and infectious diseases. TLR9 is present in dendritic cells and B cells of the human immune system. TLR9 recognises unmethylated CpG dinucleotides which are present in bacterial DNA but do not exist in the DNA innate to the human cell. When TLR9 is stimulated it triggers a both the innate, or short-term, immune response, and adaptive, or sustained, immune response. This ability to induce a highly specific, dual activation of the body's innate and adaptive immune systems differentiates from other immune therapy approaches, which are generally unable to create a sustained effect on both the adaptive immune system and non-specifically activate the innate immune system. Thanks to their special structure and sequence, the dSLIM molecules simulate an invasion by pathogens and thus activate the immune system. dSLIM immunomodulators have been shown to activate dendritic cells and B cells and induce Th1 cytokine secretion. The secreted cytokines are known to stimulate natural killer (NK) cells to destroy cells within a tumour mass.

Immunomodulatory effects of dSLIM:

- Stimulation of Th1 immune responses
- Production of therapeutic cytokines IL-12, IFN- $\alpha$
- Activation of NK cells
- Induction of CTL responses
- Promotion of tumour-specific memory responses
- Enhanced activity of chemotherapeutic agents, vaccines and antigens in combinations
- Enhanced antibody-dependent cell-mediated cytotoxicity (ADCC) in combination with mAbs

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*dSLIM suitable for broad applications*

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This wide spectrum of actions makes dSLIM suitable for a large number of applications in the treatment of cancer or infectious disease. This immunomodulator can be used to quickly launch a defence against infectious agents - even when the type of disease pathogen is not yet known. This is also true when dSLIM is used in cancer therapies, where the individual target structures (antigens) of a patient's tumour lack sufficient characteristic features. It can further be used in combination with other treatment approaches.

### **dSLIM applications**

Based on its proprietary technology platforms, MIDGE and dSLIM, MOLOGEN uses to build a portfolio of cell-based and DNA based vaccines targeting human and animal infectious diseases and various solid tumours.

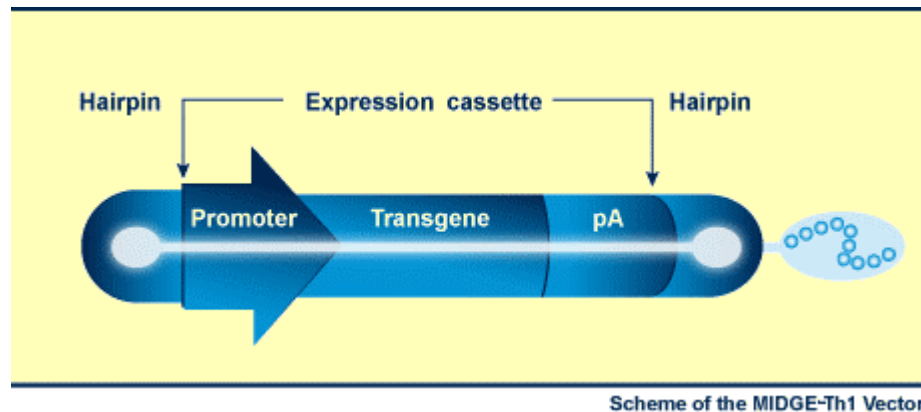
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*Target: Infectious diseases*

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### **DNA vaccines against infectious diseases**

MOLOGEN is targeting infectious diseases using its MIDGE platform. The Company has designed a series of modified MIDGE vectors that specifically trigger a Th1-response. These MIDGE-Th1 vectors carry a signal molecule that is attached to a defined site in the single-stranded hairpin structure on one side of the vector. Due to this feature, the MIDGE-Th1 vector is therefore especially well suited as prophylactics against or as a cure for infectious diseases that require a cellular immune response to protect against or cure the illness.



Source: MOLOGEN AG

MOLOGEN is developing MIDGE-Th1 vectors for the prevention and treatment of leishmaniasis, a parasitic disease and for the treatment of feline (cat) leukaemia.

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*Leishmaniasis is classified an emerging/uncontrolled disease (WHO)*

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#### **a) Leishmaniasis vaccine**

Leishmaniasis is a parasite that can be transmitted between animals and humans by sand flies. The disease affects millions of humans world wide, with approximately 12 million cases in 88 countries and is most prevalent in regions with a sub-tropical or Mediterranean climate. The World Health Organisation has classified the disease as TYPE 1, that is, an emerging or uncontrolled disease.

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*Leishmaniasis (vet): Out-licensed*

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In collaboration with the "Universitat Autònoma de Barcelona" (Spain), MOLOGEN conducted a clinical trial to test a MIDGE-Th1 based vaccine in dogs to prevent leishmaniasis. In 2006, the MIDGE-based vaccine was out-licensed to the veterinary division of a leading pharmaceutical company in the USA for continuative development. According to the Company, the veterinary market for such a vaccine can be estimated between EUR30-50m per annum. MOLOGEN is expected to receive development milestones and high single digit royalties on product sales.

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*Leishmaniasis (human): Good results in animal model*

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MOLOGEN is in the initial stages of developing a similar MIDGE-Th1 based vaccine for the treatment and prevention of leishmaniasis infections in humans. Animal studies in mice have shown that the vaccine offers superior protection over regular therapies.

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*Unmet medical need for FeLV*

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#### **b) Feline Leukaemia Vaccine**

Infections with the Feline Leukemia Virus (FeLV) are considered one of the most minatory viral infections in cats. Infected animals have a weakened immune system leading to increased infections, tumour formation, reproductive disorders, neurological disorders and eventual the death of the animal.

<sup>1)2)3)4)</sup> Please notice the advice regarding possible conflicts of interests as well as the disclaimer at the end of this document

Although a number of preventative vaccines exist, they are not 100 percent effective and have in isolated cases been associated with the development of tumors at the vaccination site.

The Company is currently optimising a MIDGE-Th1 vaccine for the prevention and treatment of FeLV. Preliminary laboratory tests have demonstrated that the MIDGE-Th1 FeLV vaccine generates a specific immune response including humoral and cellular components.

**Immunotherapeutics against cancer**

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*Target: Cancer*

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In its anti-cancer programs, MOLOGEN is pursuing a dual approach, dSLIM as an adjuvant in a prime boost vaccination scheme and dSLIM/MIDGE combination in a cell-based vaccination approach.

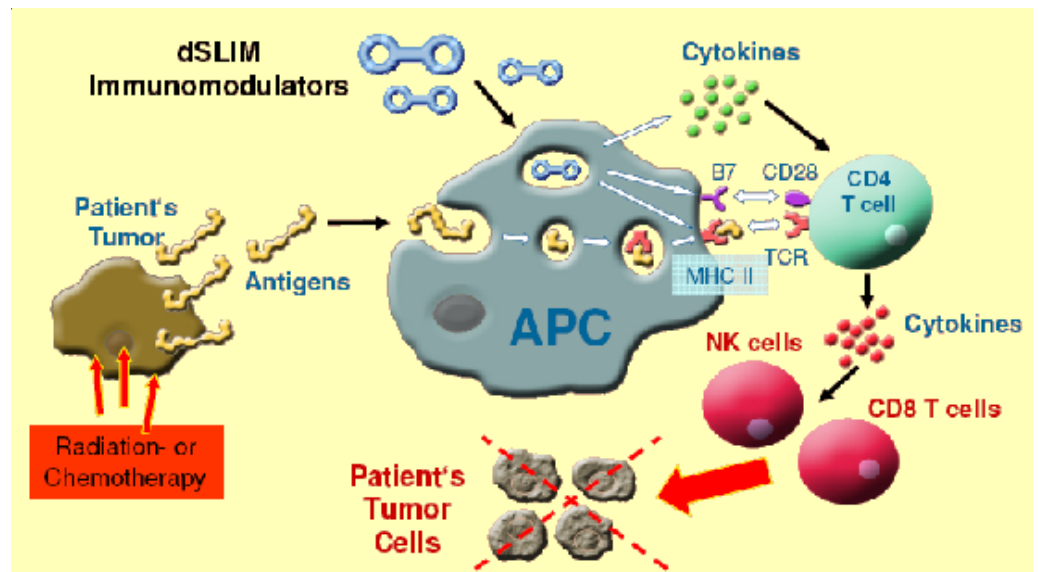
**a) dSLIM cancer therapeutics**

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*Active principle of dSLIM*

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MOLOGEN intends to use the dSLIM immunomodulators in conjunction with other treatment modalities, such as radiation or chemotherapy, in order to enhance the overall anti-tumour reaction. The dSLIM immunomodulators activate, through TLR activation the innate immune system whereby a pro-inflammatory cascade is instigated. This way, a more efficient and specific reaction against released tumour associated antigens is mounted which can eventually lead to a tumour specific immune reaction.



Source: MOLOGEN AG

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*... targeting a multi-billion Euro market*

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The Company has tested this approach in preclinical and exploratory clinical settings. Initial results of these studies indicated good efficacy and safety of the approach. In case the Company succeeds in demonstrating a benefit of dSLIM in the treatment of the targeted indications, this could represent a multi-billion Euro opportunity.

<sup>1)2)3)4)</sup> Please notice the advice regarding possible conflicts of interests as well as the disclaimer at the end of this document

*Mission: broadest possible immune response against targeted tumor cells*

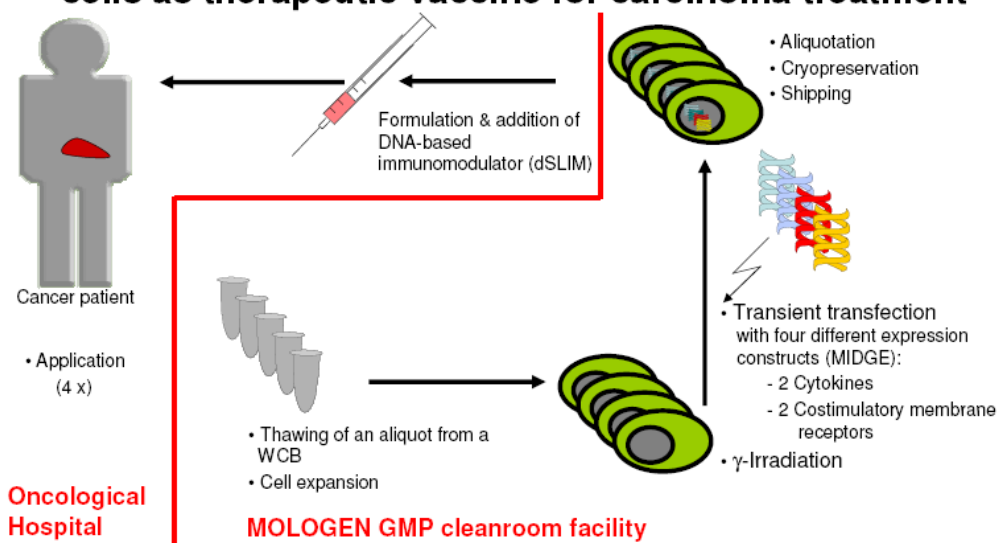
*Proprietary tumor cell bank*

### b) MIDGE/dSLIM cell-based cancer vaccines

By combining broad platforms with an allogenic cell-based cancer vaccination approach, MOLOGEN is aiming at inducing the broadest possible immune response against the targeted tumour cells. It is generally accepted that successful active immunotherapy relies on broad T-cell responses leading eventually to a specific and persistent humoral and cellular anti-tumour reaction. The best way to achieve this objective is through a combination of tumor-specific antigens and danger signals (TLR agonists & cytokines).

As a basis for its cell therapy product, MOLOGEN uses of the shelf allogenic tumour cells derived from a proprietary tumour cell bank (Master Cell Bank). According to the indication, these tumour cells are genetically modified in vitro by a combination of 4 different MIDGE vectors, coding for tumour-specific cytokine production, and irradiated for safety. Since the cancer vaccine consists of whole tumour cells, the patient's immune system can be activated against multiple tumour-associated antigens, potentially resulting in a greater clinical benefit than if the immunotherapy consisted of only a single tumour component. Additionally, the secretion of multiple cytokines by the modified tumour cells can greatly enhance the overall immune response by activating various components of the immune system on different levels against the degenerate cancer cells.

### 4-fold gene-modified, immunomodulated, allogenic tumor cells as therapeutic vaccine for carcinoma treatment



Source: MOLOGEN AG

The transfected tumour cells are combined with dSLIM, and together form the MIDGE Cell Medicine which is administered as an injection or vaccine. The dSLIM immunomodulators recruit and activate dendritic cells and B-cells at the site of the injection which is a critical step in the optimal response by the immune system to any immunotherapy product.

On the one hand, a specific immune response to the tumor-specific antigens present on the gene-modified tumour cells is triggered while, on the other, a non-specific immune response is initiated that predominantly activates what are known as natural killer cells.

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*Efficacy and good safety profile shown in animal models*

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Preclinical experiments have successfully demonstrated a good efficacy of the therapeutic. In mouse models, treatment with the therapeutic has significantly increased the survival rates of the animals. Up to now, more than 50 individual treatments of cancer patients (primary metastatic renal cell cancer, metastatic colorectal cancer, metastatic breast cancer) have been performed showing that patients respond well to the therapy. No adverse effects have been observed. This has also been confirmed in toxicological studies in animals.

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*Trends in therapeutic vaccines*

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### **Therapeutic vaccine on the verge of a commercial breakthrough?**

As the late stage therapeutic vaccine pipeline matures, more insights are gained into the pitfalls of cancer vaccine development, underlying technology platforms have seen a clear progression and more data is generated to support future development. As the delivery technologies have matured, new generations of vectors have become safer, more specific and efficient. Depending on the application, vectors with distinct characteristics have been developed for specific applications: advanced viral vectors, dendritic cells, conjugated and anti-idiotypic vaccines. Among the newer technology types, DNA vaccines are of particular interest. Non-viral (DNA) vectors are suitable for repeated immunisations and can accommodate large genes. Also vector production technologies have evolved and scaled-up (quantitatively and qualitatively) to industrial standards. Due to the generally low levels of side effects, there is an increasing trend in therapeutic vaccines development towards the use of multiple antigens (and adjuvants), to attack cancers from multiple angles. Combinations of therapies, and novel approaches such as prime-boost regimens are generating promising results.

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*Advances of therapeutic vaccines*

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As the regulatory authorities begin to gain greater experience in dealing with cancer vaccine trials, guidelines for the most appropriate path to approval are also becoming clearer. Except for the maturation of the technology and clinical development process, various other factors support the advantageous position and the market potential of therapeutic cancer vaccines:

- The platform technologies used in the development and validation of these vaccines are applicable to a wide variety of tumour types and individual profiles;
- The lack of overlap in the pharmacology of vaccines and traditional cytotoxic therapeutics opens up the possibilities of combination regimens that create synergistic efficacy without confounding side effects;
- Premium pricing will be possible for those treatments that improve the patient's quality of life while reducing or delaying the requirement for hospitalisation. Cost determinants for cancer drugs are driven by parameters such as efficacy, unmet needs, safety profile and ease of administration.

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*Additional swing comes from BigPharma*

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The increasing pressure on the pharmaceutical companies to replenish their product portfolio will create new opportunities for small companies with innovative products. As several therapeutic vaccines are moving down the clinical development path, generating proof of concept, strategic alliances between vaccine companies and pharmaceutical companies will likely be on the rise over the next few years.

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*Sector gains visibility year by year*

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As the safety and potential efficacy of therapeutic vaccine products starts to become more widely recognised pharmaceutical companies become more encouraged to invest in licensing these products. That big pharma's appetite for cancer vaccine companies is increasing is indeed demonstrated by the recent deal flow in this field and especially by the value of these deals. In July of 2005, Merck entered into a therapeutic vaccine development collaboration with Geron (financial terms were not disclosed). A few months earlier, in March, Pfizer agreed to pay an aggregate of USD515m to Coley Pharmaceuticals for the exclusive global rights to ProMune, a synthetic immune enhancer which is in Phase II development for non-small cell lung cancer, cutaneous T-cell lymphoma and malignant melanoma. Also on the M&A front, things are moving in the therapeutic

vaccine field with the acquisition of Corixa by GlaxoSmithKline for USD300m, the acquisition of Igenion by Apton for USD85m and the merger of IDM with Epimmune. With a number of late-stage vaccines moving towards market approval, it is clear that the sector will gain visibility resulting in more and earlier corporate deals.

Licenser	Licensee	Product	Conditions	Value
<b>Biomira</b>	Merck KGaA	Theratope – pIII(Breast cancer) BLP25 – pIIb(Lung cancer)	Shared development costs Co-promotion in US	USD150m in license fees, milestone payments and equity investments (May 2001)
<b>Geron</b>	Merck &Co.	Telomerase targeted cancer vaccine	Collaboration and license agreement	Undisclosed upfront, R&D, milestone and royalty payments and equity investment
<b>CancerVax</b>	Serono	Canvaxin pIII(Melanoma)	Licensing and co-promotion agreement	USD25m up-front USD12m equity investment USD253m in milestones
<b>MedImmune</b>	GlaxoSmithkline	HPV platform (preclinical)	Technology license	USD85m up-front, research and milestone payments Additional royalties on product sales (December 1997)
<b>Coley Pharmaceuticals</b>	Pfizer	ProMune(immune enhancer) (Lung cancer & others)	Exclusive global license	USD50m upfront USD10m equity investment USD455m in milestones and royalties (March 2005)
<b>Corixa</b>	GlaxoSmithkline		Acquisition	USD300m (April 2005)
<b>Epimmune</b>	IDM		Acquisition	USD50m (in shares) (March 2005)
<b>Igenion</b>	Apton		Acquisition	USD81m (in shares)(March 2005)
<b>Transgene</b>	Roche	TG 4001 therapeutic vaccine (HPV-mediated diseases)	Licensing	EUR13m up-front, EUR10m milestone for phase III, royalties (April 2007)
<b>Cytos Biotechnology</b>	Novartis	CYT002-NicQb therapeutic vaccine (treatment of nicotine addiction)	Licensing	CHF35m up-front, royalties (April 2007)

Source: MC-Services (selected therapeutic vaccine and immunotherapeutics deals)

## Markets and competitors

### aa) Cancer market

In the long run, MOLOGEN plans to treat nearly all forms of cancer with its specially developed technology. Therefore, we analysed the total cancer market in the first step.

#### Worldwide cancer development

According to current surveys conducted by WHO, a total of approximately 11m people worldwide contract cancer each year. With approximately 7m deaths per year (source: WHO, 2007), cancer is the second most common lethal disease worldwide. The WHO expects cancer incidences to double to an estimated 20m per year by 2020. This dramatic increase is explained with the increasing life expectancy, natural growth of the world population, unfavourable changes in lifestyle, and smoking.

#### Cancer development in Europe

The latest cancer incidence data for Europe was published by the International Agency for Research on Cancer (IARC), a sister organisation of the WHO which specialises in cancer research, for the year 2006. According to IARC, the total number of new cases was 3.2m in 2006 (2004: 2.9m), while the EU-25 countries accounted for 2.3m incidences (source: IARC, 2007).

#### Cancer development in Germany

The latest survey for Germany was published by Robert-Koch-Institut for the year 2002. According to the survey, there were 424,000 incidences in 2002, thereof 218,000 men and 206,000 women (source: RKI, 2003).

#### Globocan survey (IARC)

In order to determine the exact frequency of the forms of cancer with respect to the indications that can be treated by MOLOGEN, we have used the results of the international Globocan survey. This survey, which was published by IARC in 2001, includes detailed cancer data (incidence, mortality etc.) for the year 2000. With the help of the survey, incidences of the various forms of cancer can be allocated exactly to individual countries, where MOLOGEN's technology could be launched (dSLIM: FDA/EMEA, MIDGE/dSLIM: EMEA, China, Asia, India).

Therapy	Indication	Geographical Market	Incidence
Cell-based Gene therapy (dSLIM/MIDGE)	<b>Breast Carcinoma (BC)</b>	EMEA, China, India	554,181
	<b>Colorectal Carcinoma (CRC)</b>	EMEA, China, India	379,164
	<b>Non-Small Cell Lung Cancer (NSCLC)</b>	EMEA, China, India	557,619
	<b>Renal Cell Carcinoma (RCC)</b>	EMEA, China, India	53,702
DNA-Immunomodulation (dSLIM)	<b>Breast Cancer (BC)</b>	EMEA, FDA	393,499
	<b>Colorectal Carcinoma (CRC)</b>	EMEA, FDA	369,043
	<b>Non-Small Cell Lung Cancer (NSCLC)</b>	EMEA, FDA	391,845
	<b>Renal Cell Carcinoma (RCC)</b>	EMEA, FDA	81,898

Source: MOLOGEN AG; IARC (2001)

<sup>1)2)3)4)</sup> Please notice the advice regarding possible conflicts of interests as well as the disclaimer at the end of this document

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*Market analysis for leishmaniasis vaccine*


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*Market data*


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**ab) Anti-infectives market**

What is interesting to us and, in particular, relevant to the valuation of the company is the analysis of the market potential of the the leishmaniasis vaccine.

Leishmaniasis is mostly found in tropical countries but also in Southern Europe. Previously, the parasites have occasionally reached Germany through infected dogs or humans. The WHO estimates that today approximately 350m people in 88 countries are directly threatened by leishmaniasis. There are an estimated 1m to 2m new cases per year. In total, 12m people suffer from the various forms of the disease.

Since the disease is not notifiable under the German Protection against Infection Act, no incidence data for Germany is available. Following market approval, MOLOGEN's major pharmaceutical partner is first going to concentrate its marketing efforts concerning the company's vaccine (leishmaniasis in dogs) on Europe, where leishmaniasis is a very common disease in dogs (especially in Southern Spain and Southern Italy). There could no specific date regarding the incidence of leishmaniasis in Europe be found.

**ba) Competitors cancer therapy**

In analysing the competitive environment in the area of cancer therapy we have concentrated on MOLOGEN's dSLIM technology, since this technology has the greatest potential, in our assessment.

In the area of cancer therapy (therapeutic cancer vaccines), MOLOGEN's technology primarily competes with the standard therapies (surgery, radiotherapy, chemotherapy) and monoclonal antibodies (blocking cancer growth), in our assessment. In addition, there are companies which, like MOLOGEN, are working on the development of therapeutic cancer vaccines. The technology is in direct competition only with the antibodies and comparable therapeutic cancer vaccines, in our view. The current list of established competitors includes the following antibodies and comparable established cancer-treatments:

Antibodies (and comparables)	Company	Comparable Indications to MOLOGEN
<b>Herceptin</b>	Roche Group	mBC
<b>Avastin</b>	Roche Group	mCRC; filing for: mBC, RCC, NSCLC
<b>Taxotere</b>	Sanofi-Aventis	BC, LC
<b>Eloxatin</b>	Sanofi-Aventis	mCRC
<b>Erbitux</b>	Merck KGaA & Imclone	CRC
<b>Tarceva</b>	Roche Group	NSCLC
<b>Nexavar</b>	Bayer & Onyx	RCC

Source: Company Reports

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*Analysis for dSLIM-technology*


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*Competitors*


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We have found the following companies currently conducting research on therapeutic vaccines and comparable TLR9-approaches.

Therapeutical Vaccines and TLR9-Agonists	Company	Comparable Indications to MOLOGEN	Phase
<b>TroVax</b>	Oxford Biomedica / Sanofi-Aventis	BC / CRC / RCC	Phase I / Phase II / Phase III
<b>HER-2/neu</b>	GlaxoSmithKline	BC	Phase II
<b>AE37</b>	Generex Biotechnology Corporation	BC	Phase III
<b>ALVAC-CEA</b>	Sanofi-Aventis	CRC	Phase II
<b>GV1003</b>	Pharmexa	CRC	Phase II
<b>CV09</b>	Cancer Vaccines Limited	LC	Phase II
<b>Transgene S.A.</b>	Transgene S.A.	NSCLC	Phase II
<b>Stimuvax</b>	Merck KGaA/Biomira	NSCLC	Phase III
<b>Oncophage</b>	Antigenics	RCC	Phase III
<b>TLR9 Agonist</b>	Dynavax	CRC	Phase I
<b>IMO-2055</b>	Idera	RCC	Phase II
<b>CpG 7909</b>	Coley / Pfizer	BC / NSCLC	Phase II / Phase III

Source: MC-Services

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*dSLIM vs. antibodies*

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In our opinion, MOLOGEN's technology has two strong advantages over antibodies. Firstly, therapeutical vaccines have a broader immune response (antibodies: special immune response) and thus can be more effective. Secondly, the side effect profiles of the technology are significantly better tolerated and have a less weakening effect on the disordered immune system of cancer patients. For this reason, therapeutic vaccines are able to compete with antibodies in the long term. However, it is a major disadvantage, in our view, that therapeutical vaccines in general do not have a track record of market approval. This makes it more difficult to position this new form of therapy on the market, as antibodies have already been established on the market as an approved therapy.

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*Analysis for leishmaniasis (dog)*

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**bb) Competitors anti-infectives**

As for our analysis of the competition in the area of anti-infectives, we have concentrated on leishmaniasis in dogs, since it is relevant for our valuation due to the advanced stage of development. Furthermore, we focus on methods of treatment in Europe, which will be the primary target market of the vaccine.

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*Approved competitors*

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Leishmaniasis is treatable and is in principle considered curable. There is no vaccine against leishmaniasis yet, which is why MOLOGEN merely competes with the established drugs for the treatment of the disease pattern after infection (curative therapy) here. Our analysis of the treatment of leishmaniasis in dogs in Europe has shown that the most important drugs used are Allopurinol, a human medicine drug against gout, and Glucantime.

<sup>1)2)3)4)</sup> Please notice the advice regarding possible conflicts of interests as well as the disclaimer at the end of this document

Allopurinol is a very weak (orally administered) drug, which in most cases works very well and takes effect relatively quickly (within 3 to 4 months). However, a disease which weakens the dog's immune system is already enough to lead to a new outbreak of leishmaniasis so that follow-up treatment is required. Since Allopurinol, which is primarily used for the treatment of gout, is a generic product, it is very cheap.

However, this "gentle" treatment is insufficient in most cases of acute leishmaniasis. These cases are treated with the intravenous administered drug Glucantime. Whereas its effectiveness speaks for the drug (as a rule, 80% of the treated dogs are cured), its high price (approximately EUR500 per full treatment) and strong side effects are major disadvantages. Therefore, this method of treatment is reserved for particularly severe cases in advanced stages.

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*Future competitors (R&D)*

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To our knowledge, the only company which is currently developing a vaccine against leishmaniasis in dogs is the private firm Dictagene, which has a vaccine in phase I. Apart from that, several companies are working on a drug against leishmaniasis in humans (including GSK: phase II; VioQuest Pharmaceuticals: phase III).

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*MIDGE-TH1 vs. competitors*

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In our assessment, there is a healthy number of drugs which can successfully cure leishmaniasis in dogs. What we consider the primary limiting factor is the trade-off of price, effectiveness and side-effect profile, which makes neither of the drugs established on the market an ideal product. Moreover, all products on the market merely have a curative effect. Thanks to the prophylactic effect of a vaccine against leishmaniasis, MOLOGEN's vaccine will be able to achieve a significant market share, in our opinion. We feel that the success of the vaccine will depend primarily on an adequate price and the creation of an awareness of dog vaccination among dog owners. In comparison to the other R&D-stage products, we think that the competition in the indication leishmaniasis will be low, since there is only one other product which still is in phase I (MOLOGEN: phase III) and therefore has a long way to market.

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*Future potential due to pipeline*

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Although the scope of our detailed analysis does not exceed vaccination against leishmaniasis in dogs for lack of valuation relevance, we can imagine that MOLOGEN's technology will generate further vaccines in the very long term. MOLOGEN has good contact with the WHO, which opens up the opportunity that financial aid will be granted for MOLOGEN's R&D activities.

## Financials

### a) Profit and loss account

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#### *Typical biotech P&L*

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In historical terms, MOLOGEN's profit and loss account is typical of a biotech company. The profit and loss account is determined very much by low sales proceeds on the one hand and R&D expenses on the other. Since the results do not cover the expenses, the company has previously made losses on net level. Up to 2005, most sales proceeds were generated from the company's fully consolidated Spanish subsidiary VIVOTECNIA Research, which conducts research on behalf of international customers (MOLOGEN's share of VIVOTECNIA's sales for 2005: 40%; 2006: 26%). The expenses are primarily accounted for by pre-clinical and academic studies carried out within the framework of MOLOGEN's R&D activities. Additional expenses were incurred in connection with the realisation of the licence strategy, G&A and with legal and financial expenses linked with the company's stock quotation.

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#### *License agreements causes a positive trend reversal*

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A detailed look at the fiscal year 2006 shows that there was a trend reversal on the income side. For the first time, MOLOGEN was able to conclude licence agreements concerning proprietary technology (cell-based gene therapy). In the past fiscal year, the company realised initial up-front payments (total: EUR4.1m) on these agreements. As the up-front payments did not yet face any direct expenses in the past fiscal year, the income filtered through almost completely to EBIT and net income. Accordingly, MOLOGEN posted a positive net income for 2006 (EUR+0.53m) for the first time in its history.

### Balance sheet

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#### *Capital increases*

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The development of the company's balance sheet has been characterised by the capital measures of the past years. In the course of several capital increases, the company expanded its capital (not setting off net losses) by 91% between 2003 (EUR13.4m) and 2006 (EUR25.6m). Although the business development was not entirely satisfactory over time (missing of company targets, rescission of licence agreements) and the share price was burdened as a result, the company managed to fully place each capital increase, which is an encouraging sign.

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#### *Primarily equity-financed*

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Since MOLOGEN has no significant financial liabilities, the company's capital ratio was approximately 91% (91%) on the record date for 2006. On the record date, liquid funds amounted to EUR6.7m (7.8). In 2006, the company did not carry out any more capital increases since it was able to finance its investments and the funds required for operations from the available funds. The most important investment of the fiscal year was a licence agreement concerning the use of a technology (SAINT technology of Synvolux Therapeutics B.V.) which is supposed to be able to reduce dosages of drugs and increase their effectiveness at the same time. The purchase price was set up as an intangible asset (EUR2.3m), from which, in the course of an impairment test, a devaluation risk derives in case of a lack of recoverability.

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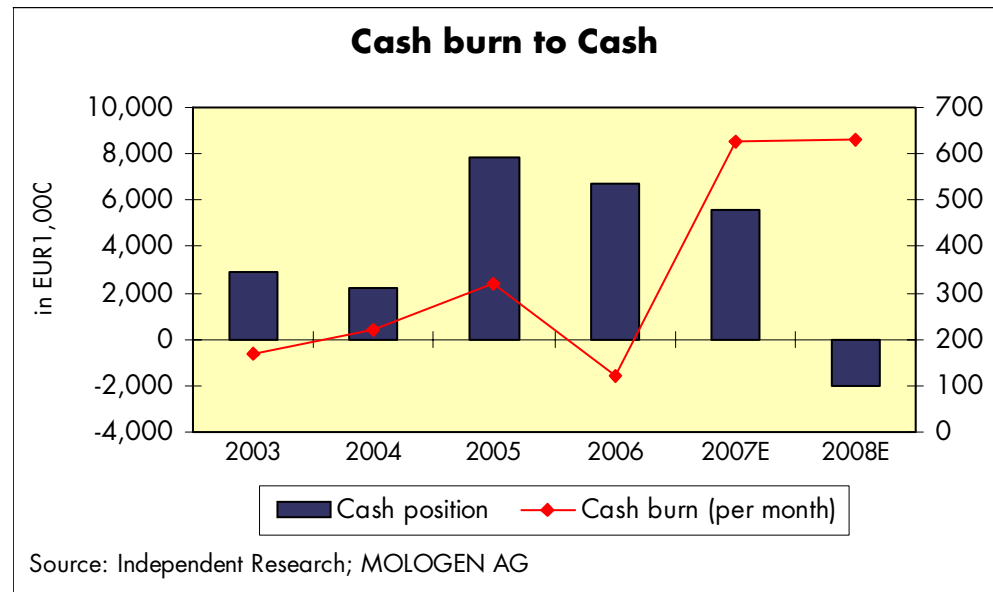
#### *Additional capital increase in 2007*

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After the record date, the company placed 800,000 new shares with institutional investors within the framework of another capital increase, which led to gross proceeds of approximately EUR6m.

*Current liquid position:  
EUR11.0m*

With an estimated EUR11.0m, MOLOGEN currently has a comfortable liquidity position, in our opinion. We proceed from the assumption that cash burn will climb to EURO.6m 2007 and 2008 per month as a result of the expansion of the company's clinical trial program. Based on the current liquidity position, we estimate that MOLOGEN would thus be able to secure financing until the end of 2008. However, this presupposes that the company will meet the timetable of the clinical trial and the business development won't deviate from the plannings. Besides, this conservative scenario does not account for any further sales proceeds from the marketing of of the company's MIDGE and dSLIM technologies.



*Initial revenues in 2007 for  
cell-based gene therapy  
possible*

We expect that MOLOGEN's first continuous revenues will come from the out-licensing of the cell-based gene therapy and the leishmaniasis (vet) vaccine. We assume that MOLOGEN's cell-based gene therapy will receive approval in 2007 for treatment in at least one country (China or India) despite the academic nature of the trials given the relatively liberal regulatory environment and the great need for alternative methods of cancer treatment. We have not accounted for any further agreements and possible licence revenue from the cell-based gene therapy due to the great uncertainty regarding the realisation of such deals (cf. rescission of UAE deal). However, we will adjust our model in the event of successful deals.

<sup>1)2)3)4)</sup> Please notice the advice regarding possible conflicts of interests as well as the disclaimer at the end of this document

## Valuation

### Model parameters

### Risk adjusted net present value model

We approached the valuation of MOLOGEN's clinical portfolio using a risk adjusted net present value model (Stewart ea., Nat. Biot. 2001). The rNPV model considers all relevant costs and cash flows (revenues, tax credits, IP costs, clinical development costs, manufacturing, marketing and third party royalty obligations) for each individual clinical project. The cash flows are determined for the product's full lifecycle starting from its current stage in clinical development till the patent expiry date.

For each stage in development (pre-clinical, phase I-III, regulatory filing and marketing) the cash flows are risk-adjusted using the theoretical success rate for a product candidate in a given phase of development to reach the market. For the rNPV calculation of MOLOGEN's clinical product portfolio, we applied the following probabilities of success rates: Pre-clinical 5%, phase I 15%, phase II 30%, phase III 67%, regulatory 81%. The resulting risk adjusted cash flows are then discounted at using a biotech-typical discount rate of 18%.

Fair value based on aggregated rNPVs: EUR118.0m

### Sum-of-the-parts valuation

To establish a fair value of the company, we have primarily considered the active clinical stage projects in our rNPV model: dSLIM against colorectal cancer (CRC) and the other targeted indications of non-small cell lung cancer (NSCLC), breast cancer (BC) and renal cell cancer (RCC). In addition we calculated the rNPV for leishmaniasis (vet), based on the deal with an US pharma company (our estimate: royalties 10%). We did not take the cell-based gene therapy for our rNPV-model into account, since we believe that there is only a small market for this technology given the extensive production and treatment process. In addition we believe that the chances for approval (EMEA) of this technology is clearly lower than for the dSLIM-approach. Based on these assumptions, and after adding net debt and a technological value for MOLOGEN's IP, we calculate a fair value of EUR118.0m for MOLOGEN (EUR12.71 per share).

Sum-of-the-parts valuation					
Product	Launch	Market Potential in EURm	Penetration	Peak Sales in EURm	Value in EURm
rNPV dSLIM CRC	2012E	1,000	8.0%	491	<b>58.3</b>
rNPV dSLIM NSCLC	2013E	1,000	7.0%	459	<b>22.9</b>
rNPV dSLIM BC	2014E	1,000	7.0%	368	<b>13.0</b>
rNPV dSLIM RCC	2014E	200	7.0%	77	<b>0.4</b>
rNPV Leishmaniasis (vet.)	2010E	40	30.0%	41	<b>2.4</b>
Technological Value (IP)					<b>10.0</b>
Cash					<b>11.0</b>
Debt					<b>0.0</b>
<b>Company Value</b>					<b>118.0</b>
Shares outstanding					9,286,848
<b>Company Value (per Share)</b>					<b>12.71</b>

Source: Independent Research

<sup>1)2)3)4)</sup> Please notice the advice regarding possible conflicts of interests as well as the disclaimer at the end of this document

Model parameters**DCF model**

In addition, we have set up a DCF model for the valuation of MOLOGEN. Within the framework of this model we have applied a two-stage valuation. Stage I covers our detailed forecasts for the profit and loss account until 2016. Our forecast for stage II (after 2016) is conservative in that we do not assume any further growth of the free cash flow (FCF). Apart from the sales and profit contributions generated by the dSLIM technology, the DCF model also includes royalties from the licensing out of the leishmaniasis vaccine (vet) and our estimate for proceeds from cell-based gene therapy treatment (premise: approval for treatment in India and China). We have assumed in our model that MOLOGEN will out-license all 4 dSLIM-indications (CRC, NSCLC, BC and RCC) after phase II. We estimate the up-front payment to be at EUR10m, the milestone-payments for phase III EUR5m and for approval EUR15mn and the royalty rate to be at 10% (dSLIM CRC: 12,5%). We resigned to take any other possible licence deals into account for our valuation given the great uncertainty regarding actual realisation of such deals.

Fair value based on DCF:  
EUR122.6m

We presume a risk-free interest rate of 4.5%. The risk premium is 10.0% for the company's equity and 8.0% for debt. Furthermore, we estimate the beta at 1.5. With respect to the long-term balance-sheet structure we assume a relation of 70% equity versus 30% debt. These premises lead to a WACC (Weighted Average Cost of Capital) of 17.50%. Based on the assumptions mentioned above, the company's equity has a market value of EUR122.6m. With 9.287m shares, this corresponds to a fair value of EUR13.21 per share.

DCF model (in EURm)	2007E	2008E	2009E	2010E	2011E	2012E	2013E	2014E	2015E	2016E
Sales	<b>1.7</b>	<b>2.4</b>	<b>12.1</b>	<b>14.0</b>	<b>30.0</b>	<b>38.1</b>	<b>65.4</b>	<b>103.9</b>	<b>107.0</b>	<b>140.6</b>
Sales growth	-	42%	415%	16%	114%	27%	71%	59%	3%	31%
EBIT margin	-490.8%	-346.8%	-91.6%	-134.3%	12.6%	66.1%	77.9%	84.4%	83.6%	86.4%
<b>EBIT</b>	<b>-8.1</b>	<b>-8.1</b>	<b>-11.1</b>	<b>-18.9</b>	<b>3.8</b>	<b>25.2</b>	<b>50.9</b>	<b>87.7</b>	<b>89.5</b>	<b>121.5</b>
- Income tax	0.0	0.0	0.0	0.0	0.0	-4.0	-10.2	-26.3	-26.8	-36.5
+ Depreciation	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7
+/- Change in long-term provisions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
+/- Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Operating cash flow</b>	<b>-7.6</b>	<b>-7.6</b>	<b>-10.6</b>	<b>-18.3</b>	<b>4.3</b>	<b>21.8</b>	<b>41.4</b>	<b>62.0</b>	<b>63.3</b>	<b>85.8</b>
-/+ Change in working capital	-0.8	-1.0	-1.0	-1.0	-1.2	-1.1	-2.0	-2.1	-2.1	-2.8
-/+ Net capital expenditure	-0.5	-0.8	-0.8	-1.0	-1.0	-1.3	-2.0	-3.1	-3.2	-4.2
<b>Free cash flow</b>	<b>-8.9</b>	<b>-9.4</b>	<b>-12.3</b>	<b>-20.3</b>	<b>2.1</b>	<b>19.3</b>	<b>37.4</b>	<b>56.8</b>	<b>58.0</b>	<b>78.8</b>
<b>Present values</b>	<b>-7.9</b>	<b>-7.1</b>	<b>-7.8</b>	<b>-10.8</b>	<b>1.0</b>	<b>7.2</b>	<b>11.7</b>	<b>14.9</b>	<b>12.8</b>	<b>14.6</b>
Sum of present values	28.6									
Terminal value	83.1			in % of total value:	74%					
Value of operative business (EURm)	111.6									
+ Excess cash (EURm)	11.0									
- Financial debt (EURm)	0.0									
<b>Fair value of equity (EURm)</b>	<b>122.6</b>									
<b>Number of shares (m)</b>	9.287									
<b>Fair value per share in EUR</b>	<b>13.21</b>									
Source: Independent Research										

**Model parameters / Entity DCF model:**

Long-term capital structure ->	Equity:	70%	Financial debt:	30%	
Risk free rate of return:	4.5%	Beta:	1.5	Risk premium debt:	8.0%
		Risk premium:	10.0%	Tax shield:	0%
		Cost of equity:	19.7%	Cost of debt:	12.5%
<b>Growth rate FCF:</b>	0.0%	<b>WACC :</b>	17.5%	<b>Date:</b>	05/18/07

<sup>1)2)3)4)</sup> Please notice the advice regarding possible conflicts of interests as well as the disclaimer at the end of this document

MOLOGEN's market cap below comparables

### Pipeline comparable approach

In order to be able to value MOLOGEN also from a market perspective, we have adopted a pipeline comparable approach. In order to arrive at a conclusive valuation we have set up a peer group exclusively from companies which are very similar to MOLOGEN in terms of development status (early to mid-stage), research area (primarily oncology) and company size. The survey shows that MOLOGEN falls significantly behind its peers in terms of market capitalisation. In our opinion, this is largely due to the younger development status of MOLOGEN's oncology products (phase I/II; peer group: mainly phase II) and the lack of business partnerships for the dSLIM technology entailed in it. Some of the peers (e.g. Coley, Idera, Oxford Biomedica) have been able to increase their market value significantly with the help of business partnerships, in particular. Given the negative sentiment towards the MOLOGEN share (moderate newsflow until 2005, revision of company guidance in the past), the company has been unable to benefit from the upswing of the industry.

Pipeline Comparable Approach									
Company	Products (according to clinical trials)*					Launch of farthest cancer product	Cash in mn	Market Cap in mn (05/18/07)	Currency
	I	II	III	Approval	Approved				
<b>Wilex</b>	2	1	1			2008E	57	172	Euro
<b>Medigene</b>	1, (1)	2		(1)	1	2011E	50	169	Euro
<b>GPC Biotech</b>	1			1		2008E	97	727	Euro
<b>Coley Pharmaceuticals</b>	(1)	1	1			2008E	98	226	USD
<b>Dynavax</b>		1, (1)	(1)			2011E	86	182	USD
<b>Idera Pharmaceuticals</b>		1				-	38	185	USD
<b>Oncolytics Biotech</b>		1				2013E	30	95	CAD
<b>Oxford BioMedica</b>		1	1			2009E	8	212	GBP
<b>Telik</b>		1		1		2009/2010E	142	318	USD
<b>MOLOGEN</b>	2		(1)			2012E	12	74	Euro

Source: Independent Research, Bloomberg

\*including only the different APIs, non-oncological products in brackets

## Conclusion

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### *Promising technology ...*

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In our view, MOLOGEN's technology is extremely promising as an effective means against cancer and infectious diseases. Although the research results that have been published so far are based on investigator-driven clinical trials which are not relevant for approval, they still indicate a good safety and efficacy profile. The company now intends to validate these results with the help of clinical trials. We feel that the high degree of specificity of the MIDGE/dSLIM technology with respect to the development of therapeutic vaccines is a genuine competitive edge over other therapies against cancer and infections. Thanks to the high degree of specificity, an efficient and safe prophylactic or therapeutic gene expression is created. Therefore, the immune system responds more specifically at lower doses. Unlike established methods of treatment and antibodies, the technology does not weaken the immune system but rather makes the body fight the cancer cells by itself. One of the most important advantages is that this therapy is tolerated very well, which makes MOLOGEN's technology a genuine alternative method of treatment. Presupposing successful approval, the dSLIM technology will become the company's primary value driver, in our opinion. In particular, the targeted indications of colorectal cancer (CRC), renal cell cancer (RCC), non-small-lung cancer (NSCLC) and breast cancer (BC) partly offer a very big market potential.

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### *... with significant advantages*

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### *Liquidity risk ...*

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In our opinion, the biggest threat to the company is a possible unexpected deterioration of the efficacy and risk profile of the MOLOGEN technology in the further course of R&D-process. Another threat is the lack of funds required for independently making a product ready for marketing. For this reason, it is an existential need for the company to enter into business partnerships within the coming two years. We proceed from the assumption that BigPharma will (first) show a greater interest when MOLOGEN has achieved proof of concept in the course of the clinical phase II trials.

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### *... although first revenues can be generated before launch*

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In our view, it is a positive sign that MOLOGEN managed for the first time to generate a substantial licence payment through marketing of its cell-based gene therapy. Nevertheless, we consider the cell-based gene therapy a niche method of treatment of cancer given the extensive production and treatment process. Therefore, this therapy will probably not turn out to be the company's growth driver in the long term. Still, a possible approval for treatment in China and India might lead to considerable sales and profit contributions and thus financially support MOLOGEN's further development activity. We expect a similar contribution from the licensing deal of the leishmaniasis vaccine (vet), which might receive market approval as of 2010.

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### *Lively newsflow expected*

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The newsflow should be lively in the coming months (e.g. decision on approval for treatment for the cell-based gene therapy; first results of clinical trials), which will determine the future development of MOLOGEN, in our opinion.

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### *Buy recommendation; price target: EUR13.20*

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To determine our price target, we apply to our DCF-Model, since this model is based on the going-concern-idea and is in better use for the long-term-valuation of MOLOGEN. Based on the DCF model, we have calculated a fair value of EUR122.6m or EUR13.21 per share, respectively, for MOLOGEN. We initiate our coverage of the company with a Buy recommendation and a price target of EUR13.20.

<sup>1)2)3)4)</sup> **Please notice the advice regarding possible conflicts of interests as well as the disclaimer at the end of this document**

## APPENDIX

<b>Profit and loss account</b>														
in EUR 1,000														
	2003	2004	2005	2006	2007E	2008E	2009E	2010E	2011E	2012E	2013E	2014E	2015E	2016E
<b>Revenue</b>	<b>523</b>	<b>2,093</b>	<b>847</b>	<b>5,227</b>	<b>1,650</b>	<b>2,350</b>	<b>12,100</b>	<b>14,042</b>	<b>30,018</b>	<b>38,120</b>	<b>65,372</b>	<b>103,861</b>	<b>107,015</b>	<b>140,605</b>
year in %	-	300%	-60%	57%	-68%	42%	45%	16%	114%	27%	7%	59%	3%	3%
Others (e.g. cell-based Gene Therapy)	523	2,093	847	5,227	1,550	2,250	2,000	3,200	3,520	3,872	4,259	4,685	5,154	5,669
dSLIM CRC	0	0	0	0	0	0	10,000	0	5,000	26,978	24,099	36,366	48,779	61,339
dSLIM NSCLC	0	0	0	0	0	0	0	10,000	0	5,000	23,956	18,019	27,191	36,472
dSLIM BC	0	0	0	0	0	0	0	0	10,000	0	5,000	24,048	18,204	27,470
dSLIM RCC	0	0	0	0	0	0	0	0	10,000	0	5,000	16,883	3,789	5,717
Leishmaniasis (vet)	0	0	0	0	100	100	100	842	1,498	2,270	3,057	3,860	3,898	3,937
Other operating income	774	502	811	465	250	250	250	250	250	250	250	250	250	250
Increase/decrease in stocks finished products	54	59	-27	80	100	100	100	100	100	100	100	100	100	100
<b>Cost of Goods Sold</b>	<b>-920</b>	<b>-753</b>	<b>-665</b>	<b>-667</b>	<b>-188</b>	<b>-350</b>	<b>-625</b>	<b>-960</b>	<b>-1,056</b>	<b>-1,162</b>	<b>-1,278</b>	<b>-1,406</b>	<b>-1,546</b>	<b>-1,701</b>
Others (e.g. cell-based Gene Therapy)	-920	-753	-665	-667	-188	-350	-625	-960	-1,056	-1,162	-1,278	-1,406	-1,546	-1,701
dSLIM CRC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dSLIM NSCLC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dSLIM BC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dSLIM RCC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Leishmaniasis (vet)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Gross profit</b>	<b>431</b>	<b>1,901</b>	<b>966</b>	<b>5,105</b>	<b>1,813</b>	<b>2,350</b>	<b>11,825</b>	<b>13,432</b>	<b>29,312</b>	<b>37,308</b>	<b>64,444</b>	<b>102,805</b>	<b>105,819</b>	<b>139,254</b>
<b>Research &amp; Development</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-4,700</b>	<b>-4,700</b>	<b>-16,450</b>	<b>-25,150</b>	<b>-17,475</b>	<b>-3,000</b>	<b>-3,000</b>	<b>-3,500</b>	<b>-3,500</b>	<b>-3,500</b>
Others (e.g. cell-based Gene Therapy)	0	0	0	0	-1,000	-1,000	-1,500	-2,500	-2,500	-3,000	-3,000	-3,500	-3,500	-3,500
dSLIM CRC	0	0	0	0	-3,550	-3,550	-7,800	0	0	0	0	0	0	0
dSLIM NSCLC	0	0	0	0	-50	-50	-7,050	0	0	0	0	0	0	0
dSLIM BC	0	0	0	0	-50	-50	-50	-8,550	-9,300	0	0	0	0	0
dSLIM RCC	0	0	0	0	-50	-50	-50	-6,300	-5,675	0	0	0	0	0
Leishmaniasis (vet)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>General &amp; Administrative</b>	<b>-3,431</b>	<b>-3,982</b>	<b>-5,018</b>	<b>-4,688</b>	<b>-5,211</b>	<b>-5,800</b>	<b>-6,462</b>	<b>-7,139</b>	<b>-8,061</b>	<b>-9,107</b>	<b>-10,520</b>	<b>-11,630</b>	<b>-12,860</b>	<b>-14,223</b>
Salaries	-1,431	-1,725	-2,150	-2,339	-2,573	-2,830	-3,113	-3,425	-3,938	-4,529	-5,435	-5,978	-6,576	-7,234
Amortization	-394	-273	-358	-486	-496	-506	-516	-542	-569	-597	-627	-658	-691	-726
Other	-1,606	-1,984	-2,510	-1,863	-2,142	-2,464	-2,833	-3,173	-3,554	-3,981	-4,458	-4,993	-5,593	-6,264
Sales & Marketing														
<b>EBIT</b>	<b>-3,000</b>	<b>-2,081</b>	<b>-4,052</b>	<b>417</b>	<b>-8,099</b>	<b>-8,150</b>	<b>-11,087</b>	<b>-18,858</b>	<b>3,776</b>	<b>25,202</b>	<b>50,924</b>	<b>87,675</b>	<b>89,459</b>	<b>121,531</b>
in % of revenues	-573.6%	-99.4%	-478.4%	8.0%	-490.8%	-346.8%	-916%	-134.3%	12.6%	66.1%	77.9%	84.4%	83.6%	86.4%
Financial result	98	30	-336	123	100	-50	-100	-100	-100	-100	-100	-100	-100	-100
<b>EBT (and minority interests)</b>	<b>-2,902</b>	<b>-2,051</b>	<b>-4,388</b>	<b>540</b>	<b>-7,999</b>	<b>-8,200</b>	<b>-11,187</b>	<b>-18,958</b>	<b>3,676</b>	<b>25,102</b>	<b>50,824</b>	<b>87,575</b>	<b>89,359</b>	<b>121,431</b>
in % of revenues	-554.9%	-98.0%	-518.1%	10.3%	-484.8%	-348.9%	-92.5%	-135.0%	12.2%	65.8%	77.7%	84.3%	83.5%	86.4%
Income taxes	-1	-2	-4	-4	-4	-4	-4	-4	-4	-4,032	-10,185	-26,303	-26,838	-36,459
in % of EBT	0%	0%	0%	-1%	0%	0%	0%	0%	0%	-16%	-20%	-30%	-30%	-30%
<b>Earnings before minority interests</b>	<b>-2,903</b>	<b>-2,053</b>	<b>-4,392</b>	<b>536</b>	<b>-8,003</b>	<b>-8,204</b>	<b>-11,191</b>	<b>-18,962</b>	<b>3,672</b>	<b>21,069</b>	<b>40,639</b>	<b>61,273</b>	<b>62,521</b>	<b>84,972</b>
in % of revenues	-555.1%	-98.1%	-518.5%	10.3%	-485.0%	-349.1%	-92.5%	-135.0%	12.2%	55.3%	62.2%	59.0%	58.4%	60.4%
Minority interests	-2	-2	-2	-2	0	0	0	0	0	0	0	0	0	0
Change of the accounting method	25	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Net profit/loss for the year</b>	<b>-2,880</b>	<b>-2,055</b>	<b>-4,394</b>	<b>534</b>	<b>-8,003</b>	<b>-8,204</b>	<b>-11,191</b>	<b>-18,962</b>	<b>3,672</b>	<b>21,069</b>	<b>40,639</b>	<b>61,273</b>	<b>62,521</b>	<b>84,972</b>
in % of revenues	-550.7%	-98.2%	-518.8%	10.2%	-485.0%	-349.1%	-92.5%	-135.0%	12.2%	55.3%	62.2%	59.0%	58.4%	60.4%
Weighted average number of shares (in 1.000)	5,111	5,317	8,288	8,402	9,120	9,287	9,287	9,287	9,287	9,287	9,287	9,287	9,287	9,287
<b>EPS</b>	<b>-0.56</b>	<b>-0.39</b>	<b>-0.53</b>	<b>0.06</b>	<b>-0.88</b>	<b>-0.88</b>	<b>-1.21</b>	<b>-2.04</b>	<b>0.40</b>	<b>2.27</b>	<b>4.38</b>	<b>6.60</b>	<b>6.73</b>	<b>9.15</b>

Source: Independent Research, MOLOGEN AG

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In valuing companies standard and accepted valuation methods (amongst others the Discounted Cash Flow Method (DCF Method), Peer Group Analysis) are applied. Under the DCF Method the capitalised value of the issuers is calculated which shows the sum of the discounted company results, i.e. the current value of the issuer's future net distributions. The capitalised value is therefore determined with reference to the anticipated future company results and the capitalisation yield applied. Under the Peer Group Analysis Method issuers quoted on the Stock Exchange are valued with reference to the comparison of ratio indices (e.g. price earnings ratio, price to book ratio, enterprise value / sales, enterprise value / EBITDA, enterprise value / EBIT). The comparability of the ratio indices is determined above all by business activity and commercial prospects.

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**As of: - 05/21/2007 -**

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