



## **MorphoSys AG – Conference Call**

### **Update on MOR103 Development Program**

January 16, 2008

*The spoken word shall prevail*

#### **Dr. Simon Moroney, CEO, MorphoSys AG**

Good morning and welcome, this is Simon Moroney, CEO of MorphoSys. With me is Dave Lemus, our CFO and Marlies Sproll, our CSO.

#### **Slide 2: Safe Harbor**

First, we would like to welcome you to this conference call and thank you for participating. We've arranged the call to provide an update on our lead development program MOR103, a HuCAL-based fully human therapeutic antibody to treat inflammatory diseases. Before I start, I want to remind you that during this conference we will present and discuss certain forward-looking statements concerning the development of MorphoSys's core technologies, the progress of its current research programs and the initiation of additional programs. Should actual conditions differ from the Company's assumptions, actual results and actions may differ from those anticipated. You are therefore cautioned not to place undue reliance on such forward-looking statements, which speak only as of the date hereof.

In December of last year, we submitted a clinical trial application (CTA) to initiate a European phase I trial of MOR103. The drug candidate is set to become the fifth HuCAL antibody to enter the clinic. During today's call we will describe the target molecule against which MOR103 is directed and its biology as well as providing information on the forthcoming phase I study. In addition, we will provide an overview of the rheumatoid arthritis market and explain why MOR103 provides an extremely lucrative product opportunity for MorphoSys.

For the participants in the conference call, you can view the accompanying slides on our corporate website. After my presentation we will open the call up for your questions.

#### **Slide 3: The Target**

First of all, some facts regarding the target molecule, which is granulocyte macrophage-colony stimulating factor, or GM-CSF for short.

GM-CSF is a well-studied molecule. It is a cytokine which was originally named for its ability to generate granulocyte and macrophage colonies from precursor cells in the bone marrow. Indeed the protein GM-CSF is itself a drug - "Leukine" or sargramostim and is used to

accelerate the recovery of white blood cells following autologous bone marrow transplantation in patients with non-Hodgkins lymphoma, Hodgkins disease or acute lymphocytic leukaemia.

More recently GM-CSF has been shown to control the behavior of various cell types, including macrophages and neutrophils, particularly during inflammatory reactions. As shown on slide number 3 of the webcast presentation, this is the basis for its relevance as a target for anti-inflammatory therapy.

The slide illustrates how blockade of GM-CSF signaling through its receptor can have a positive effect on a number of mechanisms that contribute to inflammation and tissue damage. We are particularly interested in these mechanisms as they relate to rheumatoid arthritis or RA for short, the indication we are initially focusing on. In patients suffering from RA, white blood cells move from the bloodstream into the joint. Here, these blood cells play an important role in causing the synovium, the thin tissue that lines spaces in joints, to become inflamed, which may ultimately result in joint and synovial destruction. As such, RA belongs to the class of auto-immune disorders which includes diseases such as multiple sclerosis, Crohn's disease, systemic lupus erythematosus and others.

Amongst the blood cells recruited to the site of inflammation are neutrophils and macrophages, which GM-CSF stimulates in a number of ways. Thus GM-CSF acts as an inflammatory mediator, leading to an increased production of pro-inflammatory cytokines such as TNF-alpha and IL-6, chemokines such as IL-8 which triggers migration of further cells to the site of inflammation and proteases and oxygen species which cause articular destruction. By neutralizing GM-CSF, the antibody MOR103 is intended to reduce undesired proliferation and activation of inflammatory neutrophils and macrophages and thereby block these damaging inflammatory events. As shown on the slide, blocking the effects of GM-CSF may also reduce the T- and B-cell response involved in the pathogenic process.

Several of these mechanisms are clearly implicated in rheumatoid arthritis. Indeed, there is specific clinical and pre-clinical evidence that points towards GM-CSF playing a pivotal role in RA. First is the observation that administration of therapeutic GM-CSF was found to worsen arthritic symptoms in RA patients. Second, RA patients have been found to have elevated levels of GM-CSF in their diseased joints. Third, mice that are deficient in GM-CSF are resistant to the induction of autoimmune diseases. Additional pre-clinical animal data underpin these findings, namely, that anti-GM-CSF antibodies ameliorate disease in mice arthritic models.

Taken together, these observations strongly support the hypothesis that targeting GM-CSF could be an effective means of treating RA. Further data indicate that GM-CSF is also a potential target to treat other inflammatory diseases, including multiple sclerosis, asthma and chronic obstructive pulmonary disease.

#### Slide 4: The Drug

I'd now like to turn to the drug candidate itself, MOR103.

MOR103 is an optimized, fully human, HuCAL-derived, IgG1 antibody.

In a comprehensive program combining internal work with cooperative R&D with contract research organizations, we have generated a substantial body of data around MOR103. This is not the time to discuss the data that we have generated, which we will present in full to the appropriate audience later this year. In the interests of time, I will briefly summarize those results which have convinced us to take this drug candidate into human clinical trials.

The antibody has an extremely high affinity for its target and is able to block binding of GM-CSF to its receptor *in vitro*. It prevents cytokine release, cell migration, upregulation of adhesion molecules as well as numerous other disease-relevant processes. We have studied the efficacy of the antibody in two *in vivo* RA models, namely collagen-induced arthritis in rats and streptococcal cell wall induced arthritis in rats. We have also assessed toxicity in rhesus monkeys, a species with which MOR103 cross-reacts, with no adverse clinical signs being seen.

Pre-clinical results point to a more fundamental role of GM-CSF than TNF in the pathogenesis of rheumatoid arthritis. In the mouse collagen induced arthritis model, only 2 of 15 GM-CSF deficient mice developed arthritis, whereas 8 of 26 TNF-deficient mice developed the condition.

Based on the data that we have generated, and the target biology that I have summarized, we believe that MOR103 has the potential to be an effective anti-inflammatory drug.

I'd like to turn now to intellectual property. We have a strong IP position around this program, with interests in patent applications relating to both the target and the drug.

Regarding the target, MorphoSys has signed an agreement with the University of Melbourne providing us with exclusive rights to the use of inhibitors of GM-CSF, under a United States patent application and its progeny. MorphoSys believes that the University of Melbourne patent applications, once allowed, will lead to market exclusivity for MOR103 for anti-inflammatory indications in the U.S. We see a strong IP position in the US as being of utmost importance for the commercial future of this program since the United States today represents 60% of the total RA market. Researchers at the University of Melbourne have played a leading role in characterizing the role of GM-CSF as a central mediator of inflammatory diseases. Their work is fundamental in this area and we are confident that this patent application will be granted and will be a valuable asset for our MOR103 program.

In addition to the license agreement with the University of Melbourne MorphoSys has filed additional patent applications on the MOR103 antibody in various countries. We will continue to build our worldwide patent position around MOR103 and will update you as progress is made.

## **Slide 5: The Market Opportunity in RA**

I want to turn now to the commercial opportunity for our initial focus, namely rheumatoid arthritis. As already mentioned, MOR103 has potential as a treatment in several inflammatory indications. The question therefore arises as to why we have chosen to focus initially on RA. The main reason is that this is the biggest market. Sales of anti-rheumatic drugs reached US\$ 10 billion in 2006, exceeding drug sales in any other auto-immune disease. The biggest single group of therapies in this market are the biologics, dominated by the anti-TNF drugs Enbrel, Remicade and Humira which between them account for 95% of biologics sales.

The commercial opportunity arises for three reasons – First, fewer than one quarter of patients are presently being adequately treated. Second a majority of patients who do respond to treatment become non-responders after 1-2 years. And third, the safety profile of the anti-TNF therapies remains a concern. This means that the vast majority of the 5-6 million RA patients worldwide are in need of better therapeutic alternatives.

As with any large market in the pharmaceutical industry, RA is an area that is subject to intense competition. Indeed, the successes of several biotherapeutics, such as the anti-TNFs just mentioned, have transformed the market. Importantly, rheumatologists now accept these targeted approaches, but are still looking for alternatives with new mechanisms of action. There is therefore a clear and lucrative opportunity for MOR103 if it can be successfully developed.

## **Slide 6: Development**

This brings us to the issue of clinical development. On acceptance of our clinical trial application, or CTA, MOR103 will become the first fully human antibody against GM-CSF to enter clinical trials. The phase I study will be conducted in the Netherlands, and will involve approximately 50 healthy volunteers in a randomized, double-blind, placebo-controlled, single-ascending dose trial. The study will evaluate the safety and tolerability as well as pharmacokinetics of escalating doses of MOR103. In this study we have opted to make it double-blinded to ensure the highest quality of data in determining the tolerability and safety of the drug.

## **Slide 7: Next Steps in MOR103 Development**

We expect the development to proceed according to the following timeline:

The CTA was filed in late December of last year. We are now awaiting approval from the Dutch regulatory authorities which we hope to receive within the first quarter of this year. Immediately thereafter we will initiate the trial. We anticipate the phase 1 study will take approximately 1 year, including final reporting.

We plan to publish the RA-relevant pre-clinical data that we have generated during the course of the year.

Assuming a successful phase 1 study, we plan to conduct a phase 2a study in rheumatoid arthritis patients with the goal of establishing clinical proof of concept. At this stage we do not anticipate conducting a phase 3 trial without a partner for the program. To be clear, in light of our landmark Novartis deal announced last month, we have complete freedom to partner this program when and with whom we choose. By partnering the program after clinical proof of concept, we aim to maximize the financial and other commercial terms that we can secure for MorphoSys.

This development is an important step for MorphoSys and underlines the Company's transition from a company purely providing innovative technologies to a developer of innovative antibody-based biopharmaceuticals, that we referred to after the announcement of our deal with Novartis.

That concludes the presentation. In closing, I would like to thank the entire team here at MorphoSys who have worked very hard on the development of this exciting product candidate.

We'd now like to open the call up to your questions.

#### **Slide 8: Questions & Answers**

**Operator:** We will take our first question from Christian Peter from Sal. Oppenheim.

**Dr. Christian Peter, Sal. Oppenheim:** Good morning everybody. Thank you for the update, I think it's rather complete, just one question: why do you think the target has been neglected so far?

**Dr. Simon Moroney:** That's of course a difficult question to answer and the only people who know the answer to that are the companies that have chosen not to pursue it. It would be purely speculation to try and figure out why that's the case. Obviously the fact that the molecule is a drug has meant that most attention has been spent on the molecule itself GM-CSF but I think – and I'll invite Marlies, our CSO to add to this if she sees fit – I think that some of the functions of GM-CSF have only been uncovered in the relatively recent past but its initial function for which it was named was perhaps in some respects misleading as to whether it could be a potential target for inflammatory indication, so that may be a contributing factor as to why people have overlooked it as a target for treating inflammation.

**Dr. Christian Peter:** Ok, thank you.

**Operator:** We will take our next question from Daniel Wendorff from Commerzbank.

**Daniel Wendorff:** Yes, good morning everybody, I have three questions. Firstly could you elaborate a bit on the financials of the licensing agreement with the University of Melbourne? I would completely understand if you could not give us details but is it material or is it rather

immaterial in your point of view? Second question regarding the financials of the to be conducted Phase I and then presumably Phase IIa trial, could you tell us a bit more about that? Third question regarding the timeline then of the Phase IIa trial, I would assume that almost immediately after you will have finished the Phase I you will go into Phase IIa trial – am I right with that assumption? Thank you.

**Dr. Simon Moroney:** Thanks Daniel. First of all to your question about the financials of the agreement with Melbourne, as you rightly pointed out we're very restricted in what we can say here. What I can say is that the agreement comprises an upfront payment and a typical structure that includes milestones and royalties. We can't speak obviously to the magnitude of those payments but I think what we can say certainly in respect of the up front payment that it's not something that you should worry about in the construction of your models from a material point of view.

**Daniel Wendorff:** You said in the presentation what you really got with that is the patent applications basically for the US, did I get that right?

**Dr. Simon Moroney:** What we receive is an exclusive licence to US patent applications. For reasons known only to the University of Melbourne they've only filed these patent applications in the US. For us, that's of course as I mentioned the most important market because it's far and away the largest market for inflammatory disease so therefore it's the most valuable market clearly. Secondly regarding the cost of the Phase I and Phase II studies, again we can't say too much at this stage but I think what's important to point out is that we had always planned to do this even prior to the expansion with Novartis, so this is something that we had planned and budgeted some time ago and is completely independent of the Novartis collaboration and therefore has been included in our financial planning for some time now.

**Dave Lemus:** Maybe just further to that point I think what we said already several times in roadshows in 2007, we do not expect our proprietary product developing expense to be materially different from what we had this year. You'll recall that a lot of the expense involved in these development projects is the manufacturing of antibody material and that is of course produced in advance of the trial. So, a lot of those expenses we already had in 2007.

**Dr. Simon Moroney:** Daniel, your third question, the timing of a Phase IIa. Of course it's in our interests to push this program forward as quickly as we can so indeed as soon as we have the result of the Phase I study we'd look to initiate the Phase II study. As to when we could expect results from that which I presume is what your question is getting at, it's really a little bit early to speculate on that I think.

**Daniel Wendorff:** Ok, that's fine. Thank you.

**Operator:** We will take our next question from Hans Frohnmeyer from LBBW.

**Dr. Hanns Frohnmeyer, LBBW:** Good morning, also two follow-up questions. One is if I got it right your US rights are pending and they are covered from the contract. What is with these ex-

US regions? Do you plan to file a patent also on this region or is it covered already? The second question is the field is already crowded for these immunodepressant drugs. Did you do any comparisons in the pre-clinical studies with other drugs on the market maybe?

**Dr. Simon Moroney:** The first question regarding the US and ex-US rights, as I mentioned the patent application was filed by the University of Melbourne in the US only so there is no corresponding ex-US patent application. As I said that's of rather minor concern to us because the US is by far and away the largest market for this treatment. We— based on where the patent application is in its prosecution – could expect grant of that patent during the course of this year. Of course this is something that we have ultimately no control over because it's in the hands of the Patent and Trademark Office in Washington, but the way it's progressing we have reason to be confident that it could be granted this year. Outside of the US as I mentioned there is no corresponding patent application on the target but of course our patent filings on the drug, so MOR103 itself are worldwide. In terms of the pre-clinical studies I think I'll invite Marlies, our CSO to comment on that one.

**Dr. Marlies Sproll:** In our pre-clinical models we have of course included controls to compare MOR103 with negative and positive controls. We have so far not compared our drug to other biologicals and there is a simple reason for that. You need to know that biologicals often have limitations in their cross reactivity to certain animal species and MOR103 for example has a different animal cross reactivity compared to anti-TNF so this is why you can't compare those drugs in one single model.

**Dr. Hanns Frohnmeyer:** What about the non-biologicals like Orencia?

**Dr. Marlies Sproll:** With the earlier ones we have not yet run comparisons. We have compared our drug to the standard of care.

**Dr. Hanns Frohnmeyer:** Ok, thanks.

**Operator:** We will now move to Cornelia Thomas from WestLB.

**Cornelia Thomas, West LB:** Good morning, thanks for taking my question. I think there have already been quite a lot of questions and I've only got one left. I think that MedImmune has started a Phase I trial last year in November with CAM-3001 which is a GM-CSF receptor antibody also in RA. I was wondering if you could comment on that and how much of a threat do you think that is to your program?

**Dr. Simon Moroney:** As you pointed out MedImmune is indeed developing an antibody against the receptor. We're aware of this program. The difference just for the rest of the participants in the call just to be very clear on this is our antibody targets GM-CSF itself whereas that MedImmune program targets the receptor for GM-CSF. I think it's very early but again I would invite Marlies to add to this if she sees fit. I think it's very early to speculate on whether targeting the molecule itself or its receptor is ultimately going to be the best approach here. Obviously if you look at the most successful biologic therapy for RA namely the anti-TNFs,

they're a class of drugs that target the ligand or the molecule itself TNF rather than the receptor but as I said it's dangerous to speculate as to which is going to be the best approach and that's something that I think will become evident during additional pre-clinical work and obviously in the clinic.

**Operator:** We will now take our next question from Markus Metzger from Bank Vontobel.

**Markus Metzger:** Hi everybody and congratulations to the attractive target. You're intervening with your antibody very much upstream from the pro-inflammatory cytokines like the TNF alpha and IL-6 inhibitors and maybe shutting out actually the entire innate immune system, so I wonder is there any risk of inducing susceptibility to infections? Did you see any signs from your animal models? The second question would be did you look for levels of pro-inflammatory cytokines like TNF and also look for neutralizing antibodies? Thank you.

**Dr. Marlies Sproll:** I'm happy to take over that interesting question. Of course we had a long and intense discussion internally and also with our experts and consultants on that question. I think what I would like to state is that the view may be a little bit different than was just described. We clearly see the network of cytokines being a true network in inflammatory diseases rather than a sequential process where you have upstream and downstream components. So to answer your question we don't think our safety profile will be worse than the anti-TNFs, it will be different. We do think that we have an attractive target within that network. Of course in our pre-clinical models we are monitoring certain of the other cytokines and involved molecules and we will also do that in our clinical trial.

**Markus Metzger:** Ok, and those results have been encouraging and you didn't detect any higher amounts of neutralizing antibodies?

**Dr. Marlies Sproll:** In the pre-clinical model what you can do is you can check for species reactions against your antibody but even if you go into rhesus monkeys that will never tell you the real situation for the human situation because in the human you have human-human whereas in the monkeys you have rhesus versus human, so of course we have monitored immune reactions. We haven't seen any signs of immunogenicity that would somehow prevent us from entering the trials. So all the pre-clinical data is encouraging and I think we are in a good way to go into clinics.

**Markus Metzger:** Ok, thank you.

**Operator:** We will take our next question from Thomas Schiessle from EQUI.TS.

**Thomas Schiessle, EQUI.TS:** Thank you for taking my question. I have a question on the market potential, if you will be successful in developing the drug, will that change the market dramatically so that biologicals will become the standard of care in case those biologicals will be

more potent than today's biologicals as the drugs available so that Methotextrate will not be the standard of care anymore?

**Dr. Simon Moroney:** Thomas, perhaps I'll take that. First of all I think you've highlighted an important point which we should emphasize which is the scope of the potential opportunity here. Some studies that we have seen from market research organizations suggest that up to 1% of the Western population can suffer from arthritic diseases. Now that's a number that's well beyond the current estimate of rheumatoid arthritis patients worldwide which is between 5-6 million but speaks to the enormous potential for an effective treatment for rheumatoid arthritis and at the end of the day what will count is how efficacious is the treatment and how safe is the treatment. And I think if you talk to any rheumatologist despite the enormous success of the anti-TNF therapies there is universal agreement that there is a need for better alternatives and I think one of the most attractive features of an antibody such as this, a fully human antibody is safety and indeed efficacy if it pans out and that we'll only see in the clinic of course. Another feature perhaps of an antibody that's worth noting is infrequent treatment. Again this is something that will pan out with additional work but if indeed we could have a treatment that could be administered bi-monthly for example we would have something that has an enormous convenience advantage over the existing treatments. So I think that there's no question of the size of the potential here. It is a competitive field, there's no question about that either but we have a novel mechanism of action and again if you talk to rheumatologists, that's what they're looking for. They're looking for something different and this offers that potential. We're very excited about this program and we eagerly await the outcome of the clinical studies which will really tell us if we have a drug and what the potential of that drug is.

**Thomas Schiessle:** Ok, thank you.

**Operator:** We will take our next question from Patrick Fuchs from DZ Bank.

**Dr. Patrick Fuchs, DZ Bank:** One short question, as you have mentioned it is difficult to test or compare MOR103 in mouse models of the disease CRA and the streptococcus model. Have you already done efforts in testing rheumatoid tissue transplantation models which seem to be a little bit more human and did a comparison there or is there something underway to do these kinds of tests?

**Dr. Marlies Sproll:** So far we have mainly tested MOR103 in quite a number of *in vitro* assays investigating all the potential described mechanism of actions that you have seen on the slides. We have tested it in the two described animal models. We have not yet touched transplantation models because we feel that's too complex and we couldn't find the right answer to our questions there because you somehow mix different species and different mechanisms and it makes the things even more complex.

**Dr. Patrick Fuchs:** Then a question on the ex-US potential rights on such an antibody, on a GM-CSF antibody. Could another competitor develop an antibody against this target in Europe for example?

**Dr. Simon Moroney:** As I said the University of Melbourne patents relate to the US only. There is to our knowledge no blocking IP on the target ex-US. The implication of that is indeed somebody else could develop an antibody versus the target outside of the US but as I also mentioned it could be of significance that we also have IP on the antibodies worldwide.

**Dr. Patrick Fuchs:** Ok, thank you.

**Operator:** We will take our next question from Markus Metzger from Bank Vontobel.

**Dr. Markus Metzger, Bank Vontobel:** I just wondered whether you can provide us the half life of the antibody and tell us whether you are shooting for a pegylated form of the antibody also and is there any reason to expand the development to related disease like Psoriasis?

**Dr. Marlies Sproll:** I'm happy to take that question. Of course we have investigated the plasma half life of MOR103 in the animal models we have tested so far. The half life of the molecule is as expected for a human antibody in certain animal species. This is why we don't think that it's necessary to somehow pegylate or modify the molecule, it's a full molecule with a sufficient half life and we don't want to touch pegylation, there's no need for that.

**Dr. Simon Moroney:** Maybe the other question, are we considering additional diseases? Yes indeed. I think one of the exciting features about this program is that it has potential not only in rheumatoid arthritis but also in some of the other indications we mentioned, multiple sclerosis potentially, asthma, COPD and so although we haven't made a final decision on this we're considering in fact multiple Phase II studies that would evaluate the compound in other indications beyond RA.

**Dr. Markus Metzger:** Ok, thanks.

**Operator:** As we have no further questions I would like to turn the call back over to you Dr. Moroney for any additional or closing remarks.

## **Concluding Remarks**

In closing, the key take-home messages are:

With its lead proprietary program MOR103 MorphoSys is pursuing an attractive development in a major growth market of the pharmaceutical industry. The target molecule GM-CSF is an attractive target and offers a path to a novel, non-TNF based treatment option for RA patients. We have secured a favorable patent position around both the target molecule and the antibody.

With that, we conclude the call. We are in the office for the rest of the day if you would like to follow up with us directly. Thank you again for your participation and goodbye.

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