

Strategic Alliance in Radiological Diagnostics and Therapy

For three years now, Siemens and the German Cancer Research Center (Deutsches Krebsforschungszentrum, DKFZ) have been applying their knowledge and expertise in the field of oncologic radiology in a strategic alliance. Otmar Wiestler, MD, Professor and Chairman of the Board at DKFZ, discusses the partnership's topics and goals.

By Hildegard Kaulen, PhD

Professor Wiestler, what are the aims of the strategic alliance between the DKFZ and Siemens?

WIESTLER: We want to continuously improve imaging methods and link them to create a new level of imaging quality. This information can then be used for highly precise radiation therapy planning as well as monitoring therapy progress. We have agreed on various projects with these aims in mind. In fact, the alliance between us is extremely multifaceted. For example, Siemens and the DKFZ will work together to sound out the potential of high field strengths in magnetic resonance imaging [MRI] in cancer diagnosis. Siemens is providing a 7 Tesla system. The DKFZ commissioned a new building with complex steel cladding and a special foundation to house the unit's 32-ton magnet. The two partners are also cooperating in radiation therapy.

In this field, Siemens is supplying the jointly developed ARTISTE® radiation therapy solution, which takes 3D cone beam computed tomography images just before and during the radiation therapy session to assess tumor position. Then, the therapist can adjust the therapeutic radiation to the specific tumor size and location. Soon, we will probably also try to combine an MRI unit with a source of radiation. And, in our third project, we are cooperating in the area of molecular imaging. To help treating physicians plan the radiation therapy more precisely, Siemens and the DKFZ are additionally developing a software platform that reconciles clinical images and methods into a single, coherent, big picture. Another part of our strategic alliance is the creation of the Integrated Diagnostics and Therapy Center, which will function as a link to the hospital. Here, all of the

modern imaging data will converge for inclusion in cancer therapy.

What brought the two partners together?

WIESTLER: Our strategic alliance is based on a longstanding cooperation in imaging and radiation therapy between the DKFZ and Siemens. The 160 MLC multi-leaf collimator that is used to shape the radiation field in the ARTISTE solution, is, for example, a joint development. Our future plans include forming a strategic alliance with the University Hospital Heidelberg as a third partner. The DKFZ is already in close contact with this hospital – for example, via clinical cooperation units and the National Center for Tumor Diseases.

In a strategic alliance, partners with shared interests and goals work





“The two partners are an ideal fit.”

Otmar Wiestler, MD, Chief Executive Officer, Chief Scientific Officer, German Cancer Research Center, Heidelberg, Germany

together. What makes this alliance so attractive to both sides?

WIESTLER: Cancer research and medical technology are predestined for strategic alliances. Both fields are interested in how technical developments can make diagnostics and therapy even more precise and more tolerable for patients. Because of the short development cycles, the business risk in this field is also easier to assess than, say, in the pharmaceutical industry, where ten to 15 years pass before a new product comes to market. During the same time span, medical technology makes swift advances, as past developments have shown us. In addition, the two partners are an ideal fit. The DKFZ provides Siemens with its large body of scientific expertise in cancer research. In return, the scientists at the DKFZ receive access to the latest generation of Siemens equipment and the opportunity to be involved in the further development of the hardware and software components. Clinical evaluation is tremendously facilitated through our close connection with the National Center for Tumor Diseases. The latest prototypes have to be tested on patients quickly, which is one reason why cooperation arrangements with clinical partners are so important. It doesn't work without the patient.

Are these kinds of alliances also politically desirable? After all, one of the aims of the European Union is to become the most dynamic, most competitive, knowledge-based economic area in the world.

WIESTLER: It certainly makes sense to have political support. But whether a strategic alliance works doesn't depend on politics. The strategic alliance between the DKFZ and Siemens is based on what the two partners bring to the table and how they live out the alliance. It's all about complementary strengths in oncologic radiology and about dealing with each other in a true spirit of partnership. The outcome is a direct win-win situation for both partners.

And, by the way, the idea for this cooperation came up during a meeting with Professor Erich Reinhardt, who, at the time, was the head of Siemens Healthcare. There was a desire to pool our efforts and develop intelligent new products that reach the patient quickly. That's why we are working together on high-field magnetic resonance imaging, Adaptive Radiation Therapy, and molecular imaging. These ideas are also in line with the new role of imaging, which is increasingly becoming an instrument of holistic disease management, from the initial

findings through to monitoring the course of therapy.

You mentioned the inclusion of patients. How does the strategic alliance benefit patients?

WIESTLER: The patients are included right from the start through clinical studies. One of the alliance's stated goals is to ensure that these promising new methods are put into clinical use quickly. We want to make lasting improvements in the quality of cancer care provided. And that definitely is something that benefits the patient.

Which types of cancer is the strategic alliance examining?

That depends on the individual projects. We are currently using the 7 Tesla MRI unit to scan patients with brain tumors. Our colleagues in that project are building on data collected using a conventional 3 Tesla MRI scanner. They are checking whether additional information can be gained from a scan at a higher field strength and if so, what that information entails. Alongside much improved anatomical resolution, these new units can also be used to depict molecular spectra in the smallest possible space. This permits highly precise tumor characterization. Plus, this unit is still in the prototype stage. Both partners are putting a lot of work into the further development of this new technology.

What are the plans for other kinds of cancer?

WIESTLER: In the area of lung cancer, we are working closely with the chest clinic here. We believe further development of Adaptive Radiation Therapy will particularly benefit lung cancer patients, whose tumors move with every breath. These tumor movements should be taken into account during radiation therapy in order to spare as much healthy tissue as possible. The aim, in this case, is to arrive at a radiation therapy that adapts to movement. Colon carcinomas and prostate cancer are similarly affected by changes

in position, because they are shifted by the contents of the intestine and the bladder. Just like in lung cancer, radiation therapy is a key component in prostate cancer treatment. Because the organ is surrounded by sensitive structures, radiation should be applied as precisely as possible. Prostate cancer is currently the most frequently diagnosed type of cancer in men.

What about molecular imaging? Have there already been tangible results in this area?

WIESTLER: Molecular imaging provides information on the molecular composition and functional characteristics of the tumor. The requirements that apply to new tracers, however, are very strict. They have to be tumor-specific and it must be possible to make them visible. They have to be distributed throughout the body and find their target molecule. In addition, it is important for them to remain within the body long enough to supply a good positron emission tomography [PET] image. But, they also can't be eliminated too slowly in order to avoid placing unnecessary strain on the patient. That's a challenging profile, and one that isn't easy to fulfill. It's no coincidence that marked glucose still remains the most frequently used PET tracer. But in our strong alliance with Siemens, I am really confident that we will master this challenge.

Should there be more strategic alliances like the one between the DKFZ and Siemens? Does this cooperation serve as a model for others?

WIESTLER: In Germany, we have strong research institutions and a thriving medical technology sector. We just have to get the results into the value chain faster. The connection between these two worlds carries a great deal of potential for the rapid transfer of innovative research into clinical applications. We need cooperative arrangements to achieve this, and they have to meet certain conditions in order to succeed. The alliance must be based on strong partners, as is the case between

Summary

Challenge:

- New developments in medical physics, medical technology, and radiation therapy should reach patients faster than before.
- Strategic alliances need strong partners with complementary expertise that ensures a win-win situation for them.

Solution:

- The strategic alliance between Siemens and the DKFZ is based on longstanding cooperation with shared product developments.
- Both partners established the prerequisites for the strategic alliance themselves, making them independent of short-term sponsoring programs.
- There are plans to bring the University Hospital Heidelberg into the strategic alliance as a third partner.
- The cooperation between the partners encompasses diagnosis and therapy for brain tumors, lung cancer, and prostate cancer, among others. The alliance aims to achieve better tumor characterization and integrate all image data into a shared data set that can then be used for a highly precise radiation therapy plan.
- Initially, the alliance will address the entire value chain for cancer: calculating the risk of disease, identifying cancer earlier and characterizing it precisely, planning and applying radiation therapy or other therapies optimally, and measuring therapeutic success.

Result:

- The strategic alliance aims to improve the quality of cancer care.

the DKFZ and Siemens, that complement each other in terms of their subject expertise. And, they have to bring a lot of tenacity to the table. Both DKFZ and Siemens are at the international cutting edge of their respective fields. Many political initiatives fizzle out because they are originally designed to run for just a few years, and when their time is up they can't find subsequent financing. The special thing about the strategic alliance between Siemens and the DKFZ is that both partners have created the conditions for it on their own, not through an aid program. At the same time, raising funds from

outside sources, as we have now done with DOT-MOBI, a sponsoring program run by the Federal Ministry of Research, is an important goal for the alliance.

What will the future hold in terms of content?

WIESTLER: Our next goal will be to cover the entire value chain. That means calculating the risk of disease, identifying cancer earlier and characterizing it more exactly, planning and implementing radiation therapy and other treatments very precisely, as well as measuring therapeutic success. That's how we will con-

tinuously become more successful in the fight against cancer. That is, after all, the big goal both partners had in mind when they entered into this arrangement.

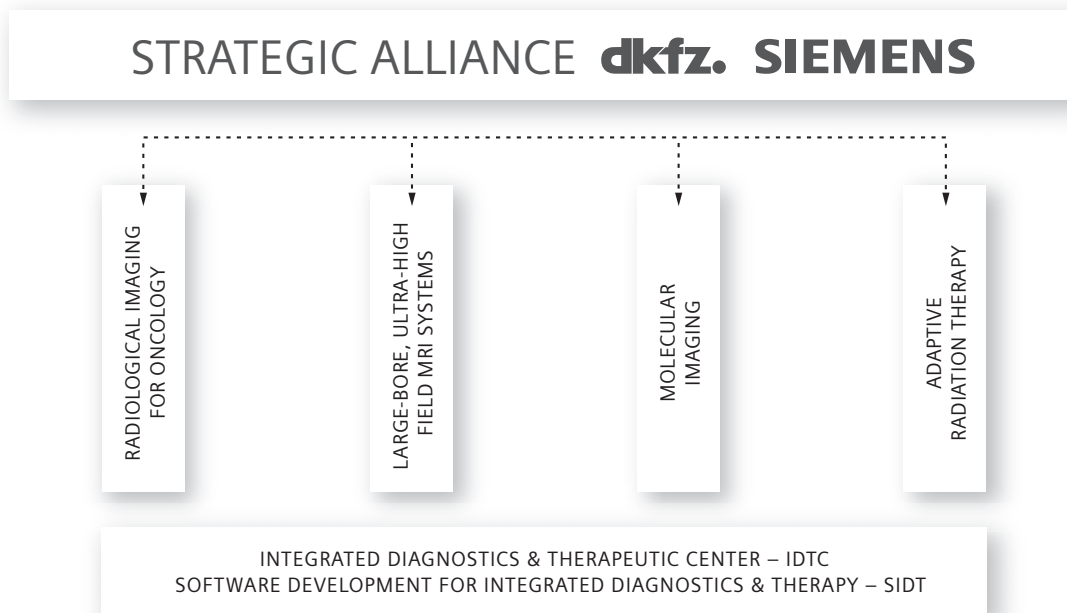
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Further Information

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The German Cancer Research Center and Siemens are breaking new grounds with the cooperation between a national research center and a commercial enterprise.



The four pillars of the strategic alliance between the German Cancer Research Center and Siemens rest on a solid base.