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## **Innovation in molecular imaging – detect diseases before they show clinical symptoms**

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### **Demand**

The diagnosis of diseases still remains a demanding task. Imaging techniques for a reliable clinical diagnosis of, e.g., Alzheimer's disease are complex and limited. Currently, a definite diagnosis of Alzheimer's disease can only be conducted by autopsy. There is a high medical need for an easy, non-invasive imaging technique that allows an early and precise diagnosis of diseases. The positron emission tomography (PET) supports the practitioner to diagnose or exclude a variety of diseases. Disease-specific biologic processes can be visualized by PET on a molecular basis. The sugar molecule tagged with radioactive fluorine (F18-FDG) is an established PET-tracer and is used as a source of energy in the cell. During decay positrons are emitted with which the distribution of the sugar in the tissue can be analysed. Thereby, enhanced metabolic processes, e.g. in tumor cells, can be visualized. Disadvantage: Also inflamed tissue accumulates the tagged sugar.

### **Solution**

Molecular imaging aims at a very early detection of diseases. Possibly, these can be detected in the future even before they clinically manifest. The development of such techniques raises hope to allow precise characterization of tumors or diseases of the central nervous system. This could help to choose the optimal therapy for the respective patient and thus lead to better treatment outcomes. A good usage of individually tailored therapies could also reduce healthcare costs.

### **Implementation**

Bayer Schering Pharma is already pursuing various promising approaches in molecular imaging. The company's main focus of research is the diagnosis of neurodegenerative, oncological and cardiovascular diseases.

The most advanced project, BAY 94-9172, is currently in phase II of clinical development. BAY 94-9172 could offer the first possibility to support an early detection of Alzheimer's disease with an in-vivo imaging method. The substance tagged with fluorine binds to amyloid beta, an accumulation of protein in the brain causally related to Alzheimer's disease. Molecular imaging has an enormous potential to improve prevention, early and precise diagnosis of diseases as well as therapy-monitoring.

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