2 AIM OF THE WORK

The present work is part of a long-term project supported by the Deutsche Forschungsgemeinschaft (DFG)[I], which aims at the construction of dendrimer drug-conjugates for anticancer-therapy. The highly interdisciplinary context of this project demands for the cooperation of researchers in the field of synthetic chemistry, biochemistry, pharmacy, and medicine.

The present work aimed at the synthesis of water soluble dendrimers. These macromolecules had to carry appropriate chelating ligands for platinum complexation as well as a fluorescence label. The enhanced solubility in water was to be realized through non-ionic, monodisperse oligo ethylene glycol-chains (OEGs). Efficient strategies had to be evaluated for the preparation of novel OEGylated building blocks containing suitable binding-sites. The well-defined decoration of dendrimers with two pharmacologically interesting building blocks was to be done. Therefore the synthesis of *tris*-orthogonal branching units had to be optimized. Co-complexes of platinated dendrimers and substituted ethylene-diamine ligands were to be synthesized in cooperation.[II] Fluorescence tags were to be attached to provide molecules which allow for studying cellular uptake and intracellular distribution. Cleavable or degradable linkages and targeting moieties for controlled release were to be evaluated and had to be incorporated to the dendrimers.

The versatility of the synthetic strategy was to be shown by the preparation of a set of dendrimers, differing in size (generation) and in substitution pattern. There are practically no systematic studies available yet which would allow a rational design of a dendritic carrier. It was therefore the final goal of this work to examine the relevant pharmacological properties in cooperation with pharmacists and biochemists to allow further optimization of the carrier design.

[I] SFB 448, “Mesoskopisch strukturierte Verbundsysteme”, Teilprojekt A1

[II] These ligands showed active, site-specific targeting on certain types of cancer. Their potential was observed by the cooperating research group of Prof. R. Gust.