Design, Development and Clinical Evaluation of Ligand-Targeted Therapies and Imaging Agents

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We are developing methods to target drugs specifically to pathologic cells, thereby avoiding collateral toxicity to healthy cells. In the case of cancer, we have exploited up-regulation of the folate receptor on cancers of the ovary, lung, kidney, endometrium and breast to target imaging and therapeutic agents to these cancers. Clinical trials of six folate-linked drugs demonstrate that the aforementioned strategy holds promise for increasing drug potency while reducing unwanted toxicity.

We have also developed a targeting ligand that selectively delivers attached drugs to PSMA on prostate cancer cells. Imaging and therapeutic studies suggest that this targeting ligand can not only improve diagnosis of the disease, but also enhance treatment of prostate cancer. Recent pre-clinical and clinical data on this targeting ligand confirm this anticipation.

Additional cancer-specific ligands that target malignancies of the pancreas, stomach, brain, liver, colon, skin and esophagus are also under investigation. Moreover, use of these ligands to “light up” cancer tissues with tumor-targeted fluorescent dyes during surgeries are being developed and videos of recent surgeries of ovarian and lung cancer patients will be presented.

Finally, targeted imaging and therapeutic agents for the diagnosis and treatment of

autoimmune, inflammatory and infectious diseases will also be briefly described. Included in this part of the talk will be a brief description of novel targeted therapies for rheumatoid arthritis, heart disease, Crohn's disease, psoriasis, influenza virus infections and malaria.