The Arnusch Group – Research Outline

Our research involves the hybridization of polymer and organic chemistry with problems related to water filtration and purification. Specific topics include: Biomimetic membranes, which includes elements of molecular recognition, and multivalency effects for prevention of membrane scaling and biofouling and for purification of water and wastewater; Design and characterization of new membrane polymer compositions; Definition of parameters involved in membrane fouling and degradation by accurately controlling the design and composition of polymer layers on membranes; Application of 2-D and 3-D printing in membrane fabrication and post-fabrication modifications, as well as new devices; Microfluidic electrodialysis devices.

Graduate Students and Postdoctoral Fellows

Masters student: Shai Badalov Oct. 2012-2014

Masters student: Katy Jukovski Oct. 2012-2014

Postdoctoral Fellow: Dr. Immanuel V.: start date Oct. 2012-

Recent Publications 2011-2012

Arnusch, C. J.; Pieters, R. J.; Breukink, E. Enhanced Membrane Pore Formation through High-Affinity Targeted Antimicrobial Peptides. *PLoS ONE* **2012**, *7(6)*, e39768.

Chamorro, C.; Boerman, M. A.; **Arnusch, C. J.;** Breukink, E.; Pieters, R. J. Enhancing membrane disruption by targeting and multivalent presentation of antimicrobial peptides. *Biochim Biophys Acta*. **2012**, *1818(9),* 2171-2174.

Arnusch, C. J.; Albada, H. B.; van Vaardegem, M.; Liskamp, R. M. J.; Sahl, H. G.; Shadkchan, Y.; Osherov, N.; Shai, Y. Trivalent Ultrashort Lipopeptides are Potent pH Dependent Antifungal Agents. *J. Med. Chem*. **2012**, *55*, 1296-1302.

Arnusch, C. J.; Ulm, H.; Josten, M.; Shadkchan, Y.; Osherov, N.; Sahl, H.-G.; Shai, Y. Ultrashort peptide bioconjugates are

exclusively antifungal agents and synergize with cyclodextrin and amphotericin B. *Antimicrob. Agents Chemother*. **2012**, *1*, 1-9.

Olrichs, N. K.; Aarsman, M. E. G.; Verheul, J.; **Arnusch, C. J.**; Martin, N. I.; Herve, M.; Vollmer, W.; de Kruijff, B.; Breukink, E.; den Blaauwen, T. A novel *in vivo* cell wall labeling approach sheds new light on peptidoglycan synthesis in Escherichia coli. *ChemBioChem* **2011**, *12*, 1124-1133.