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Published on *Institute for Bioscience and Biotechnology Research* (https://www.ibbr.umd.edu)

2 IBBR Researchers Receive UM Ventures Seed Grants

August 1, 2018 -- Earlier this summer, IBBR Fellows **Dr. Silvia Muro** and **Dr. Daniel Nelson** were each awarded $15,000 Seed Grants from UM Ventures.

UM Ventures is a joint technology transfer initiative of the University of Maryland Strategic Partnership: *MPowering the State*. The UM Ventures Seed Grant Program supports University of Maryland inventors as they work to move their innovations toward commercial viability.

Dr. Muro's project will expand the applications of her patented peptides that specifically target cellular structures called lysosomes, defects of which are the cause of a range of severe genetic disorders. Dr. Muro's peptides enable delivery of biological therapeutics across the blood-brain barrier, and then into lysosomes. Dr. Muro now plans to attach her peptides to new biologics against additional lysosomal and other neurodegenerative disorders, such as Parkinson's disease.

Dr. Nelson's project will advance his patented technology that targets *Bacillus* bacteria, including the organism that causes anthrax (*B. anthracis*) and another that causes a serious form of food-poisoning (*B. cereus*). Dr. Nelson's group has identified nine families of *Bacillus*-destroying enzymes from viruses that infect and kill *Bacillus*. The current project involves "mixing and matching" components of these proteins to optimize their activity and translational potential.

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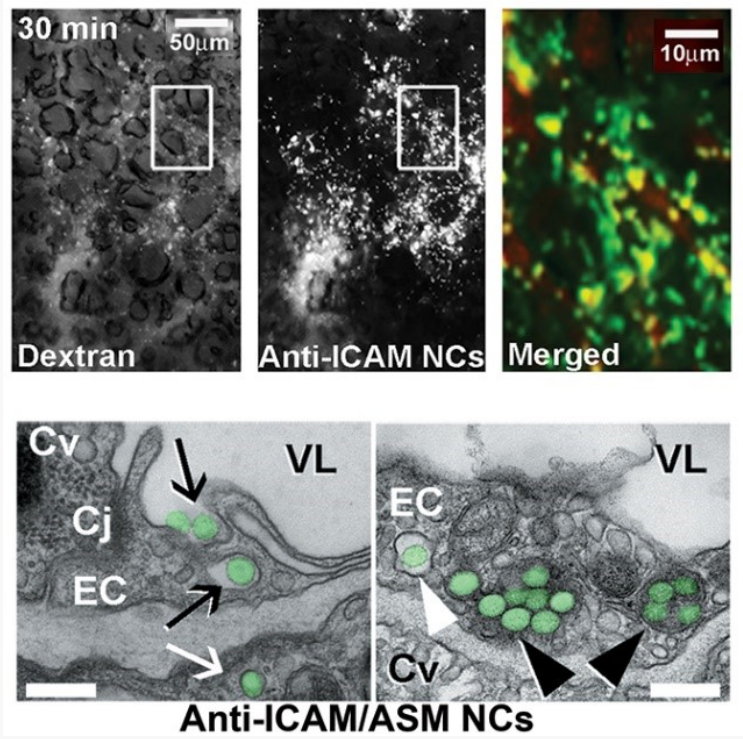
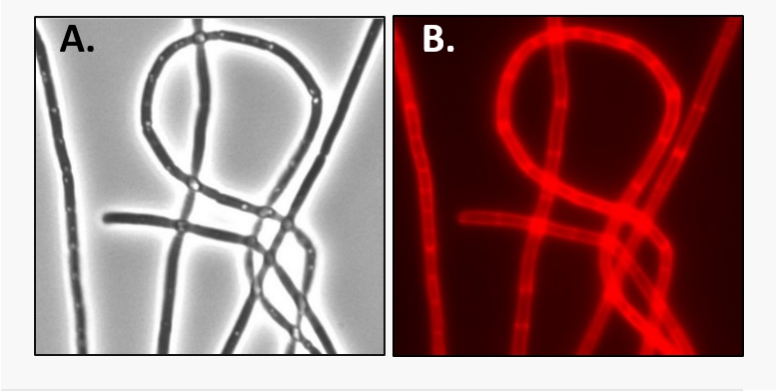


Endocytosis and lysosomal trafficking of therapeutic carriers in mouse lungs. *(Top) Polymer nanocarriers (NCs) bearing therapeutic acid sphingomyelinase (ASM) and targeted to ICAM-1 were observed by fluorescent microscopy to reach the lungs 30 min after i.v. injection in mice (green spots). (Bottom) Transmission electron microscopy of lungs collected 3 h after i.v. administration confirmed the presence of NCs (green) interacting with lung endothelial cells (ECs). For instance, NCs can be seen being engulfed by cells (black arrows), within cell endosomes (white arrowheads) and lysosomes (black arrowheads), and into subjacent epithelial cells (white arrow). VL = vessel lumen. Cv = caveolar vesicles. Cl = clathrin vesicles. Cj = cell junction. Scale bars = 300 nm. Reproduced from Garnacho et al. (2017) Mol. Ther. 25(7):1686-1696*



Fluorescently-labeled binding domain of the PlyP56 endolysin recognizes and binds to an evenly distributed ligand on the surface of B. anthracis Ames 35 strain. (A.) Bright-field image. (B.) Fluorescent image. Red scale bar = 5 µm.