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The Path Report

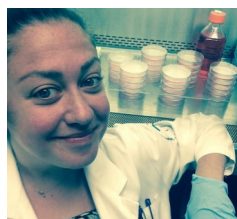
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SPRING 2018

Spotlight on Research: Jessica Puzzuoli

Jessica C. (Black) Puzzuoli came to the department of pathology at New York Medical College (NYMC) from the department of pathology at Memorial Sloan-Kettering Cancer Center (MSKCC). Prior to MSKCC, she completed her undergraduate studies at Tufts University in Medford, MA and CUNY Lehman College in Bronx, NY. She received a B.S. in biochemistry and spent her undergraduate years studying antibiotic resistance, specifically penicillin. She completed an undergraduate thesis in the use of tetrapeptides for beta-lactamase inhibition. In addition, she worked as a research assistant in the nuclear medicine department of MSKCC for several years where she studied the efficacy of isotopes I-124 and I-133 for use in PET scans. She spent her undergraduate summers doing research on solid tumors in children, specifically neuroblastoma, as an International Scholar Laureate at both the University of Melbourne and Sydney Children's Hospital in Australia.

Since her arrival at NYMC, Jess has been working with her mentor Dr. Paul Lucas on what their lab has determined to be a unique population of human adult stem cells known as multipotent adult stem cells (MASCs). It had been previ-



ously established that MASCs were able to differentiate into mesodermal and ectodermal phenotypes in vitro under Dexamethasone (Dex) treatment. Jess demonstrated that these cells are also able to differentiate into endodermal phenotypes with treatment with Dex. After these findings, Jess went on to conduct in vivo xenogenic studies in a rat model. Not only did the MASCs survive in vivo eliciting no immune response, but the human MASCs also differentiated into vasculature, glands, hair follicles, and dermis in the rats. Jess then decided to characterize the MASCs using RNA-

sequencing and to also do a comparison to other stem and differentiated cell types. RNA-seq was performed on the human MASCs and then compared to RNA-seq analyses for human bone marrow-derived (BM) mesenchymal stem cells (MSCs), human placenta-derived (PL) MSCs, human embryonic stem cells (ESCs), and a differentiated cell type, human airway-derived smooth muscle cells (SMCs). She identified 46 genes that are unique in their expression to MASCs as compared to the other stem cell and differentiated cell types that do not express these genes at all. She has shown that not only are the MASCs enriched for pathways involving mesodermal, ectodermal, and neuroectodermal differentiation, but they are also active in the endodermal differentiative pathways.

Moving forward, Jess' interests lie primarily within pediatric cancer research. She is planning on pursuing a post-doctoral fellowship with her end goal being a career in bench-to-bedside translational research with a focus on pediatric oncology.



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New Degree Program

The Department of Pathology is proud to announce the development of a new program which has been submitted to the New York State Education Department for approval before implementation. This newly developed **Medical Laboratory Scientist (MLS) program** is expected to be accredited by the National Accrediting Agency for Clinical Laboratory Science (NAACLS) and will lead to a Master of Science degree in Pathology.

Students in the MLS Program will complete coursework at New York Medical College and Clinical Laboratory training at Westchester Medical Center and after one year, will be eligible to take the American Society for Clinical Pathology Board of Certification Exam for Medical Laboratory Scientists. Upon passing this exam, the student will qualify to apply for New York State licensure as a Medical Laboratory Scientist – MLS^{cm}. Once acquired, this license would allow the student to work as a Medical Laboratory Scientist while continuing studies toward a Master's degree in Pathology at NYMC.

Please contact Dr. Carol Carbonaro at carol_carbonaro@nymc.edu or Debbie Isabella at debbie_isabella@nymc.edu at for updates on the progress of this Program.



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