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Tumor-associated macrophages (TAMs) are the most abundant innate immune cell type in tumors. TAMs can either inhibit or support tumor progression, though it is unclear how their dichotomous functions are regulated. Dr. Alexandra Schnell predicts that the functional heterogeneity of TAMs may be due to distinct lineage origins and cell plasticity. To investigate these hypotheses, Dr. Schnell is developing a myeloid-specific lineage tracing tool to track TAM heterogeneity in tumors, and in response to immunotherapies. Schnell will conduct these experiments in Dr. Jonathan Weissman's and Dr. Kipp Weiskopf's labs at the Whitehead Institute. By better understanding TAM heterogeneity, Schnell hopes to enable the development of TAM-targeted cancer immunotherapies that specifically target tumor-promoting macrophages.

During her PhD, Schnell studied the fundamental mechanisms of the immune system in Dr. Vijay Kuchroo's lab at Harvard Medical School. There, Dr. Schnell performed lineage tracing of immune cells during autoimmune inflammation. Her studies provided a mechanism for how homeostatic intestinal immune cells act as a reservoir for pathogenic inflammation elsewhere in the body. With this background in immunity and lineage tracing, Dr. Schnell will now investigate how the heterogeneity of tumor immune cells can be leveraged to generate new cancer immunotherapies.

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