

Preface

Many times in science we have witnessed the “rebirth” of old ideas and discoveries that were abandoned for a long time and even discarded! And then suddenly, one day they come back to stay and become very “trendy” subjects. A couple of examples quickly come to my mind: cancer immunotherapy and regulatory T cells. The crucial role of the immune system in controlling neoplasms was proposed more than a century ago. However, this has been widely accepted in the biomedical community only after the therapeutic success of, for example, immune checkpoint inhibitors. The case of regulatory T cells is even more compelling. A significant number of research groups during the 1970s and early 1980s described a particular subset of immunosuppressive T cells. A careful review of these early papers reveals that the experiments carried out with these suppressive T cells are surprisingly similar to the current trendy “Treg” experiments. Unfortunately, research on suppressive T cells abruptly stopped during the early 1980s due to the lack of specific markers identifying these cells. These cells were difficult to isolate, and the reproducibility of suppression assays was rather poor. Then, thanks to Sakaguchi and colleagues, work on suppressive T cells was strongly restarted after they identified natural regulatory T cells based on high expression of the CD25 marker. These cells could be isolated and worked with.

Could it be possible that research on myeloid-derived suppressor cells (MDSCs) is another example? It might be so. The pro-carcinogenic role of tumor-infiltrating myeloid cells was evident since as early as the 1970s. These myeloid cells were highly immature and lacked expression of other lineage markers. Then research on immunogenic cell lineages took over the study of these “obscure” pro-carcinogenic subsets. Everybody was studying macrophages, dendritic cells, neutrophils, eosinophils, and obviously, T cells and natural killer cells. Around the year 2000, a few groups identified these pro-carcinogenic myeloid cells by the expression (and lack of expression) of certain markers. Suddenly the research on MDSCs increased so much that the number of papers on MDSCs increased from about a dozen 10 years ago up to nearly 500 in 2015 alone.

We think that MDSC research has just started and we are experiencing a “rebirth” of an old subject, thanks to the pioneering work of a small number of groups. As MDSCs are relatively unknown (although this is quickly changing), the authors of this book thought that it was worthy to write a guide to the specialized reader who wants to know more about this myeloid subset.

We sincerely hope that we have achieved our goal of writing a concise but thorough review on the current knowledge on myeloid-derived suppressor cells.

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Myeloid-Derived Suppressor Cells and Cancer

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2016, IX, 102 p. 8 illus. in color., Softcover

ISBN: 978-3-319-26819-4