The search for the origin of immune cells for the future: a Society 5.0 vision for a bright Japan

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Introduction

Japan leads the world in regenerative medicine using iPS cells. Immunotherapy is one of those.

However, hematopoiesis, the process of generating immune cells, is still a source of debate. Here, we present that the myeloid-based model best fits the observations.

Models

The "conventional" model starts with a two-way fork between myeloid and lymphoid cells. The myeloid-based model, proposed by Kawamoto *et al.*, presents a much more complicated scenery, with myeloid potential persisting until the last branch.

The findings of Adolfsson *et al.* (2005), Wada *et al.* (2008), Bell *et al.* (2008), and Balciunaite *et al.* (2005) all fit the myeloid-based model, along with many other previously unexplained phenomena.

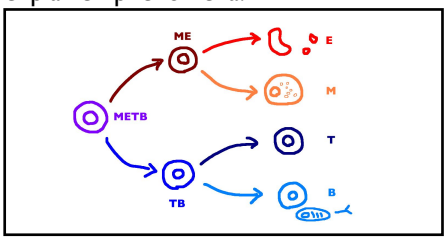

Fig 1. The conventional model.

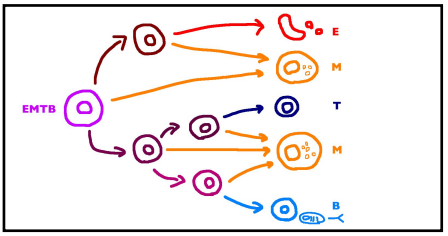

Fig 2. The myeloid-based model.

Conclusion

While numerous models attempt to explain hematopoiesis, the myeloid-based model currently offers the most robust explanation for the observed plasticity in immune cell development.

Validating this model is a crucial step toward manipulating immune cells for the advanced regenerative therapies envisioned in Society 5.0.

This research also epitomises the Japanese strength in basic research. Nobel prize laureates have repeatedly talked about the necessity of basic research, and this is one of those.

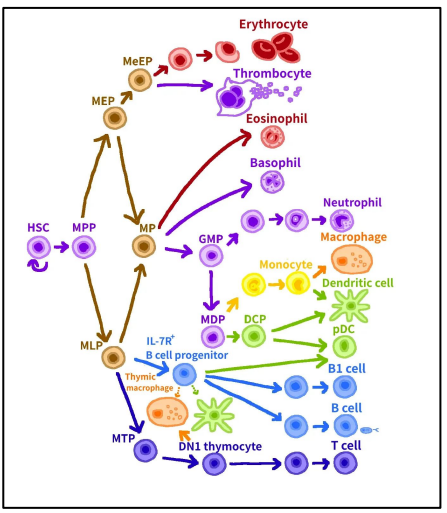

Fig 3. The myeloid-based model, adapted from Kawamoto (2011).

References

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