

Born in Rama, an Arab Palestinian village in the Galilee region of Israel, Prof. Jacob (Yaqub) Hanna earned his BSc in medical science (2001), PhD in immunology (2007), and MD in clinical medicine *summa cum laude* (2007) from the Hebrew University of Jerusalem. He conducted postdoctoral research at the Whitehead Institute for Biomedical Research at MIT. He joined the department of Molecular Genetics at the Weizmann Institute in 2011.

Prof. Hanna is pioneering techniques in induced naïve pluripotency from adult cell and synthetic whole embryo models made solely from stem cells ex utero. Induced pluripotent stem (iPS) cells have regenerative properties almost identical to those of embryonic stem cells, but can be created from adult cells without using an egg or fetal material. Prof. Hanna was the lead researcher in a study that showed how further-modified iPS cells could be used to treat sickle-cell anemia in mice, the first proof of concept of the therapeutic application of iPS cells. Prof. Hanna has uncovered novel pathways regulating the reprogramming process and was the first to derive pristine “naïve” human pluripotent cells equivalent to those derived from mice and (i) can generate “cross-species humanized chimeric” mouse models that have human derived tissues (ii) can give rise to human primordial germ cell (progenitors of egg or sperm) or (iii) to all extra-embryonic compartments (placenta and yolk-sac). He was the first to expand prolonged periods of advanced and normal mammalian embryo development from pre-gastrulation until late organogenesis in an “artificial uterus” environment outside the maternal womb. The latter platform enabled him to demonstrate the ability to be the first to generate advanced stage whole synthetic embryos made entirely from naïve pluripotent stem cells in the petri dish, that can complete gastrulation and demonstrate organ formation within adequate extra-embryonic compartments. In addition to demonstrating the power of cell reprogramming and ex utero synthetic advanced embryogenesis, his work offers the promise of powerful new research models for degenerative diseases, infertility, and modeling human early development.

During his postdoctoral work, Prof. Hanna received a prestigious Novartis Fellowship from the Helen Hay Whitney Foundation. In 2010, he was awarded the Sir Charles Clore Prize for Outstanding Appointment in the Weizmann Institute. He received an EMBO young investigator award (2012), a Rappaport Prize in biomedical research (2013), a Krill Prize by the Wolf Foundation (2013), and the Helen and Martin Kimmel Award for Innovative Investigation (2014). In 2014, he was featured among “40 under 40” innovative scientists by the prestigious journal *Cell* and was elected as a member of EMBO in 2018. In 2021, he ranked at the top of the list of 50 leading world thinkers by Prospect magazine.