The Big Book of Bovine Embryos

a University of Florida Guide

Version March 7, 2013

UF UNIVERSITY of FLORIDA
DAIRY SCIENCE RESEARCH

The purpose of this collection of images of bovine oocytes and embryos is to assist new bovine embryologists with identification of structures encountered under the microscope. Unless otherwise stated, all images are of oocytes and embryos from in vitro maturation, fertilization and culture procedures performed in the laboratory of Peter J. Hansen, University of Florida.

The images are of oocytes and embryos viewed under inexpensive microscopes, usually dissecting scopes. By collecting typical views as might be seen in many laboratories, it is hoped to facilitate the process of learning to identify structures.

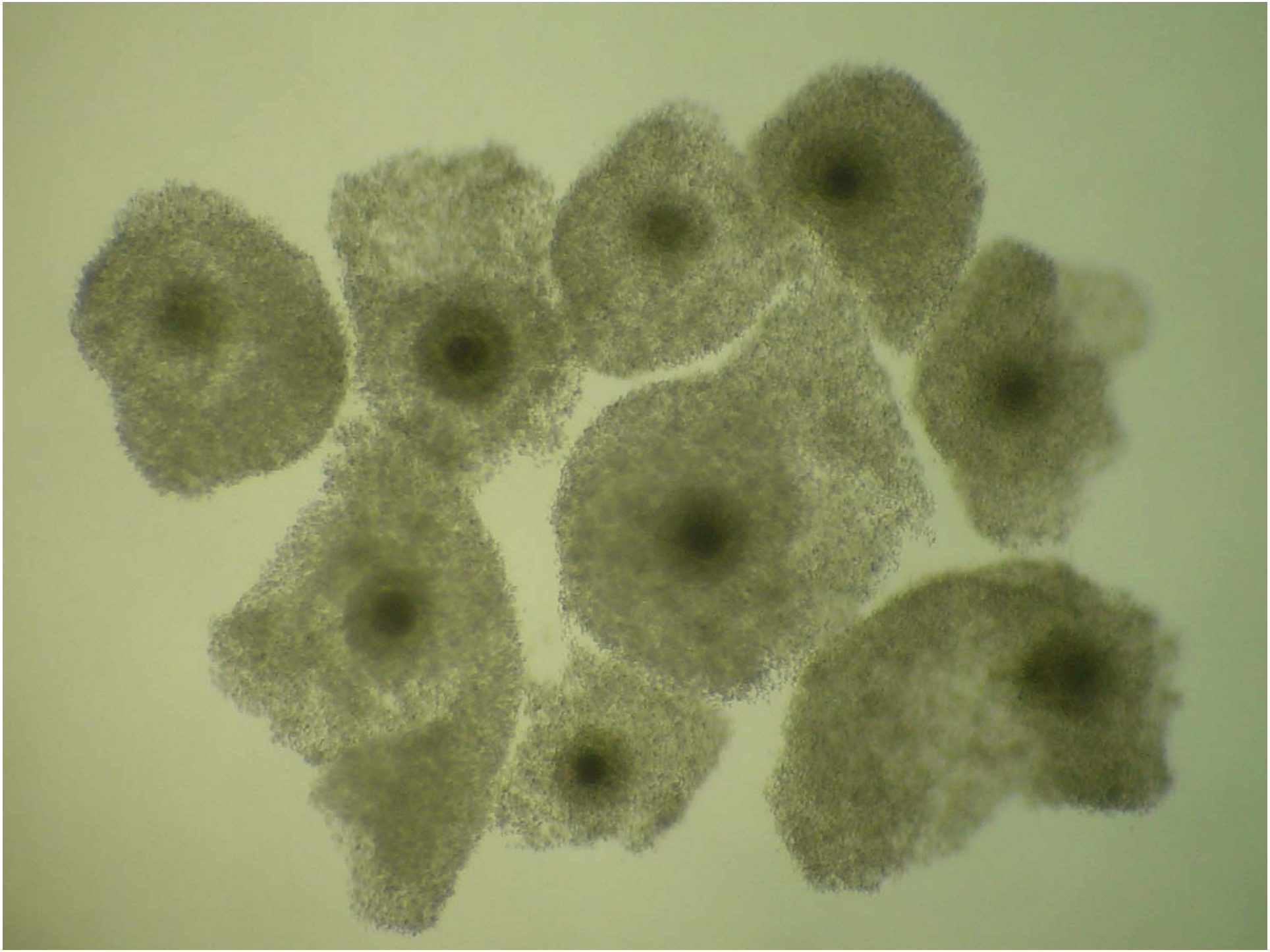
Where known, the name of the person providing the image is on the lower right corner of each image.

Each image is shown twice – once without a label and a second time with important features identified. There is no particular order to the images and, in general, the magnification is not shown.

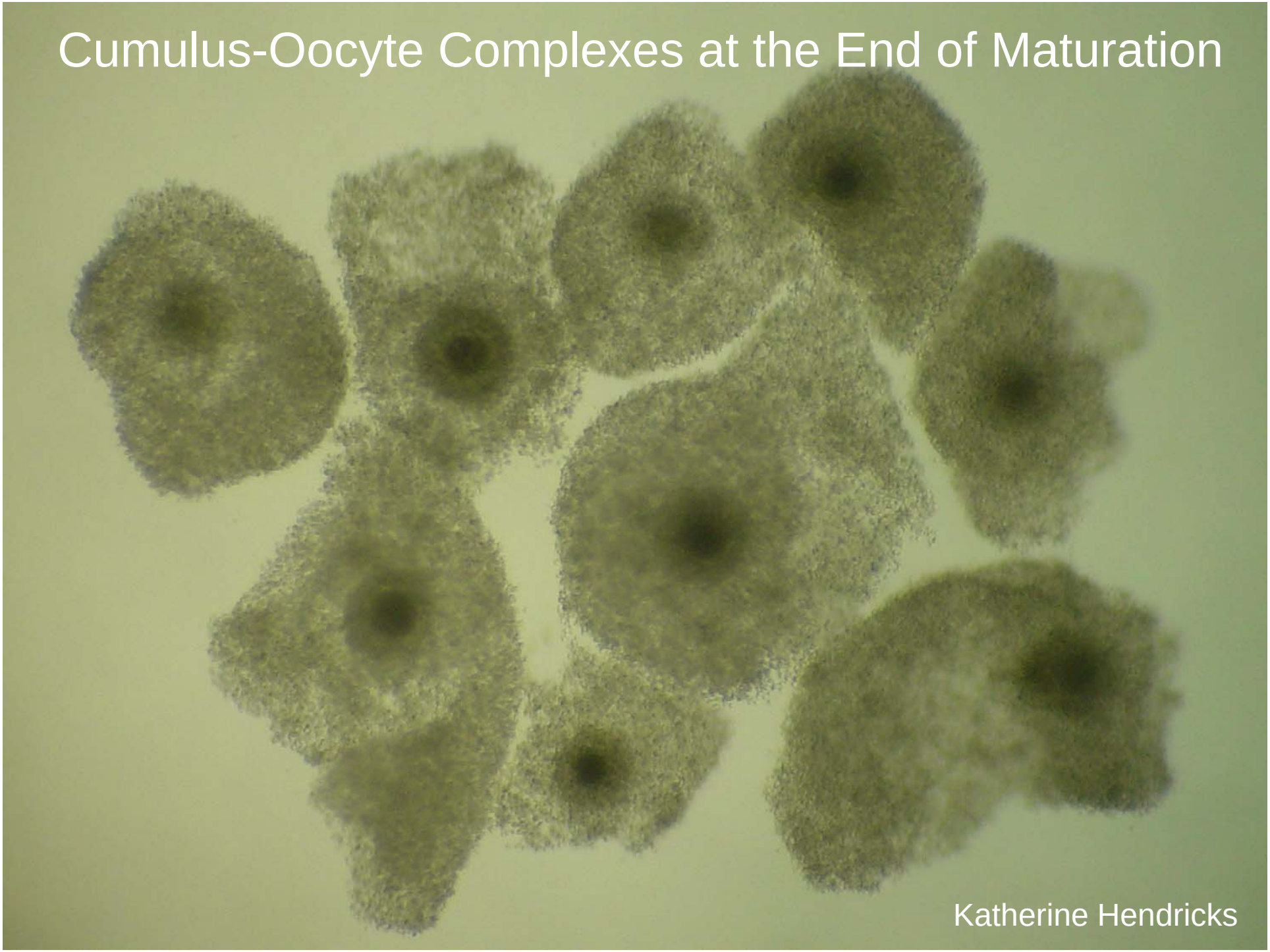
The Big Book of Bovine Embryos will be updated as more images are collected.

Let the Viewing Begin……

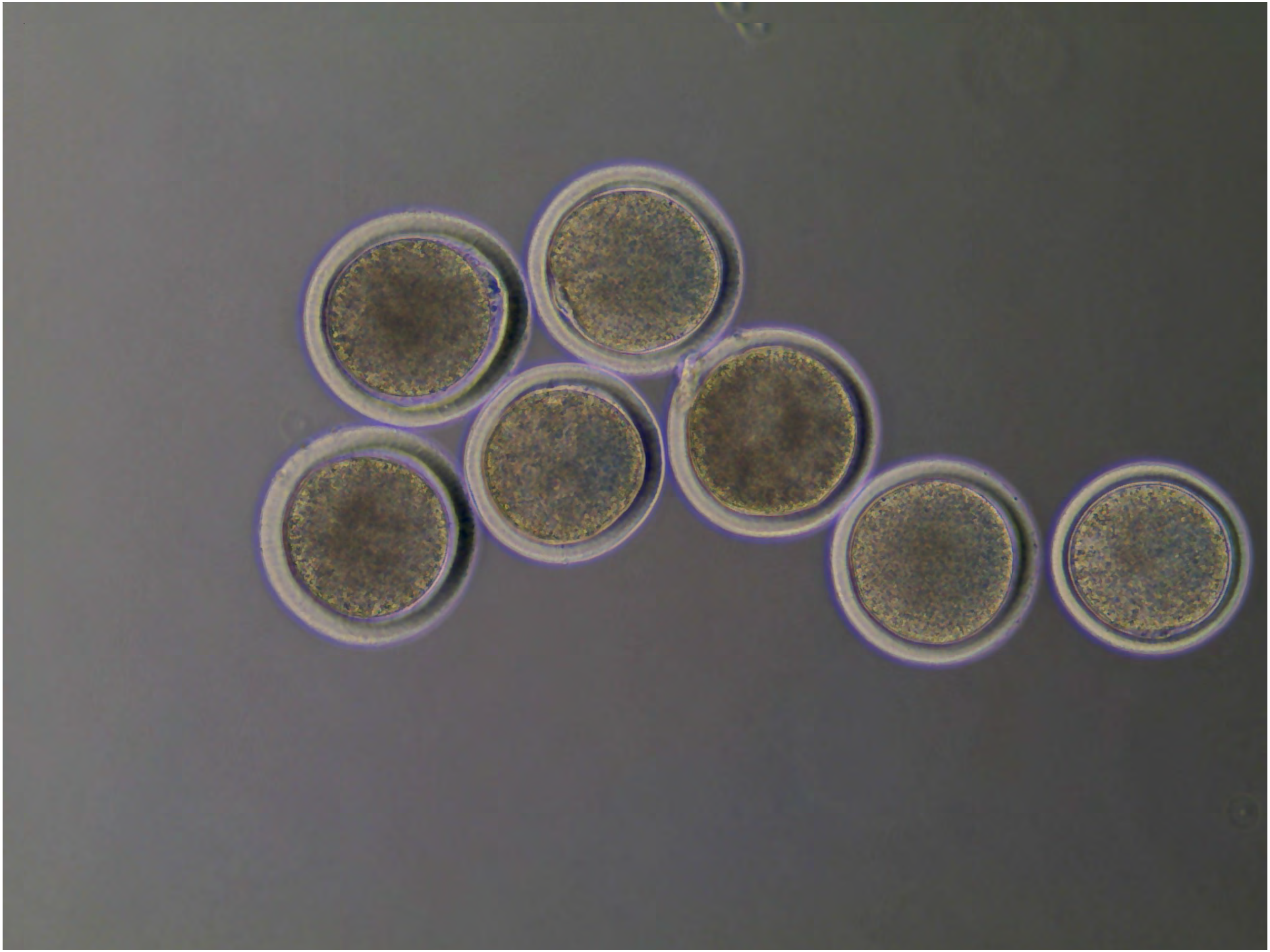
First, oocytes and embryos in developmental sequence
(special thanks to Firdous Khan)



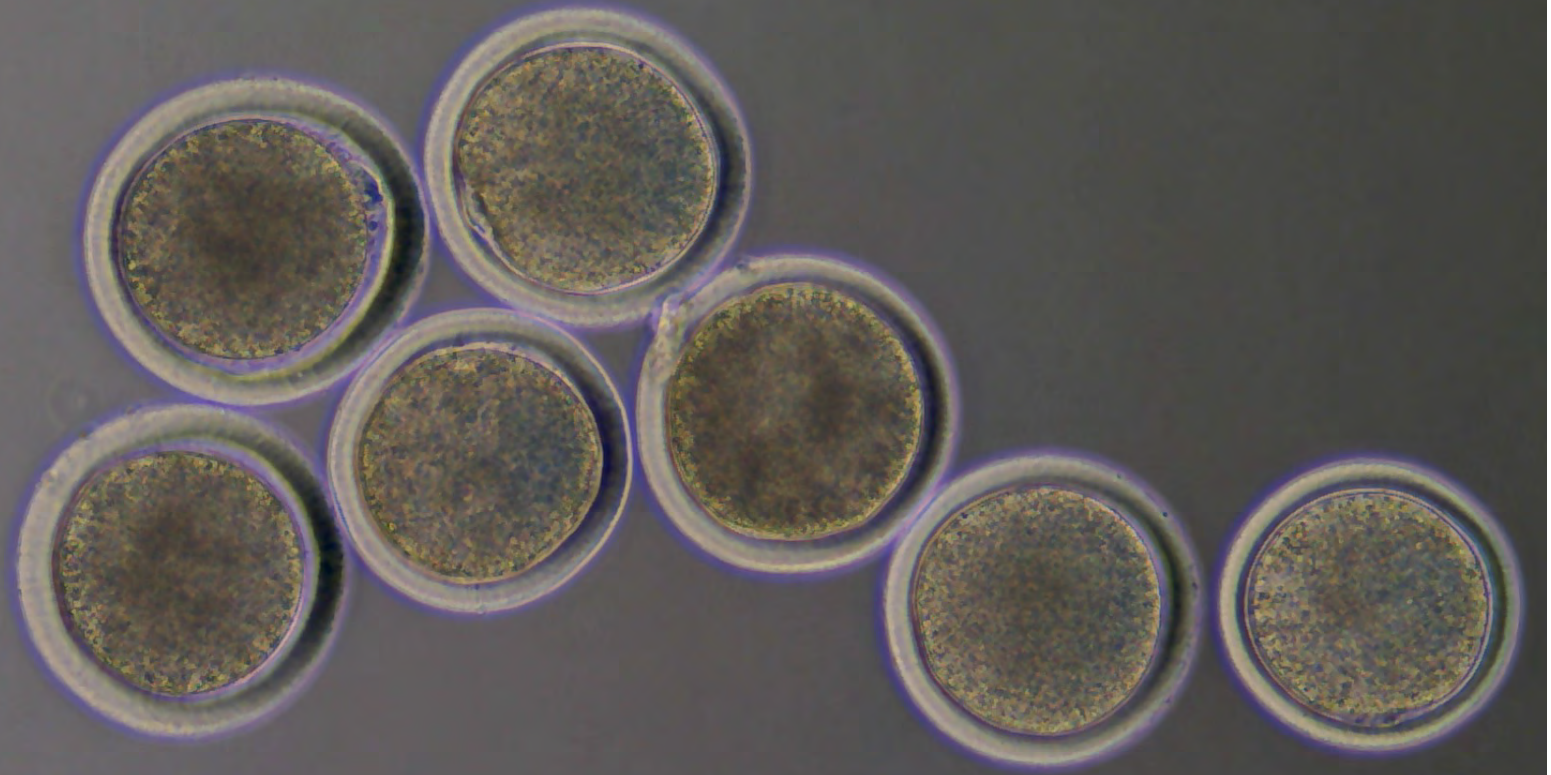
Cumulus-Oocyte Complexes at the End of Maturation



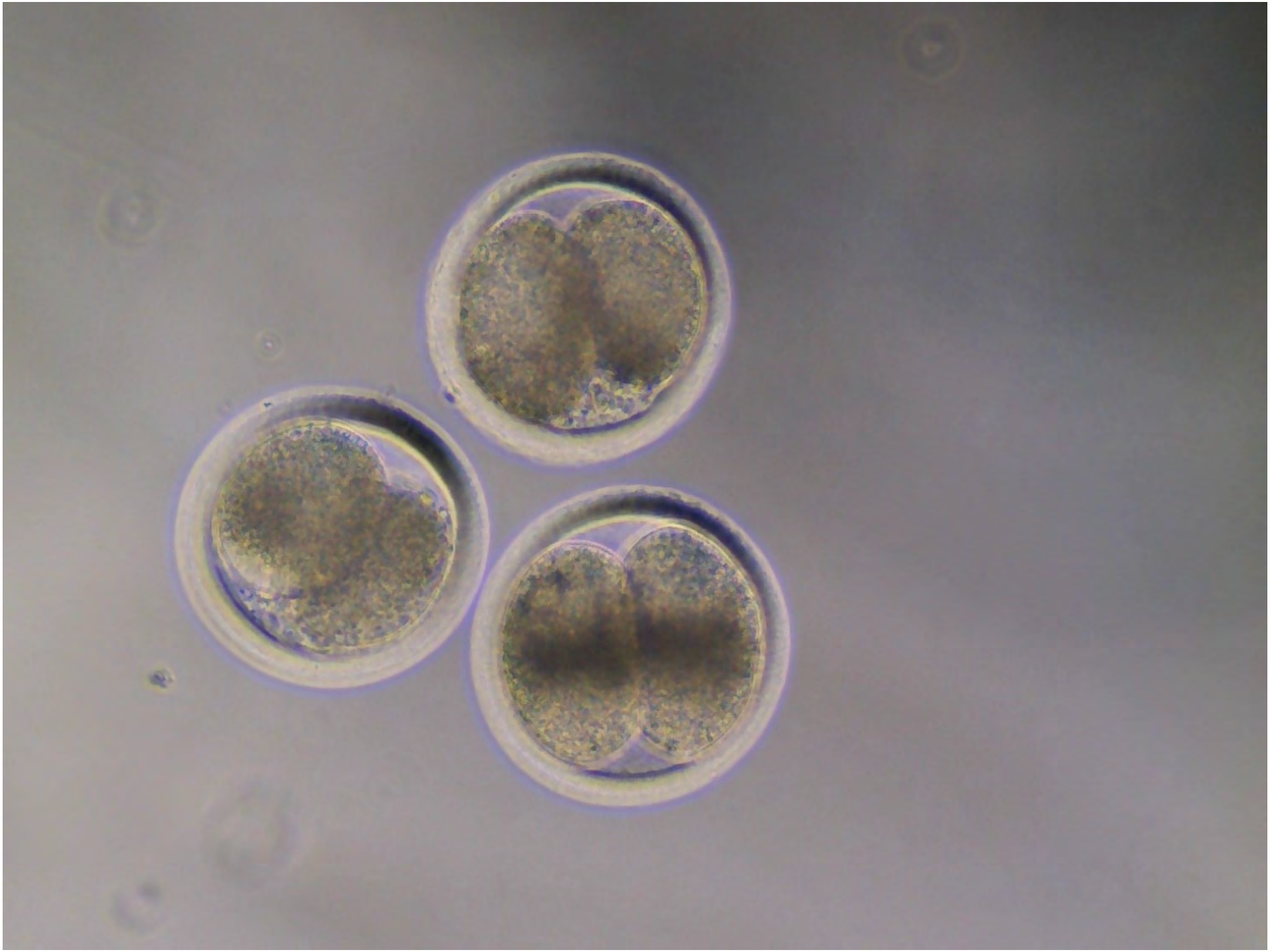
Katherine Hendricks



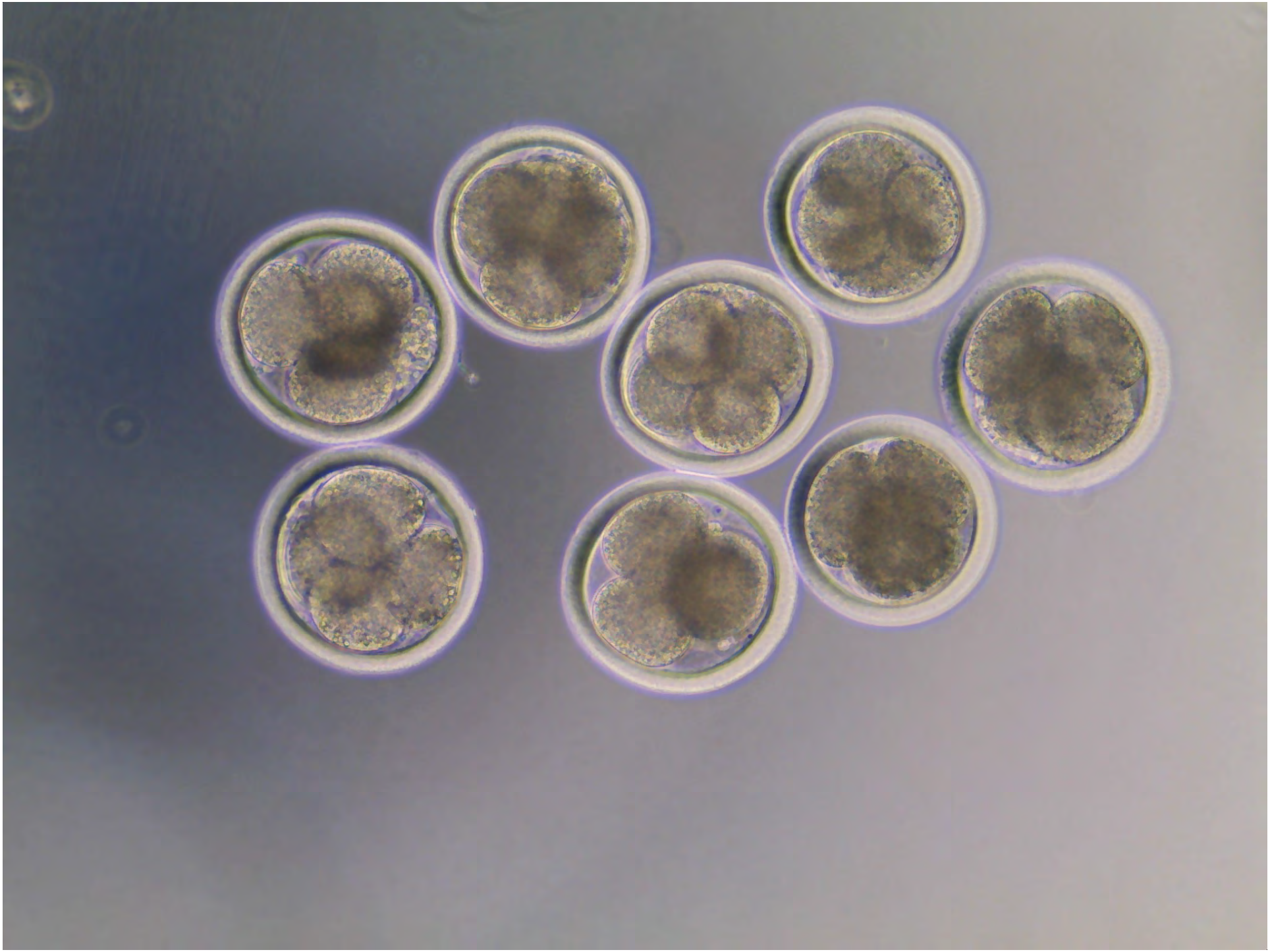
Matured oocytes
(after treatment with hyaluronidase)

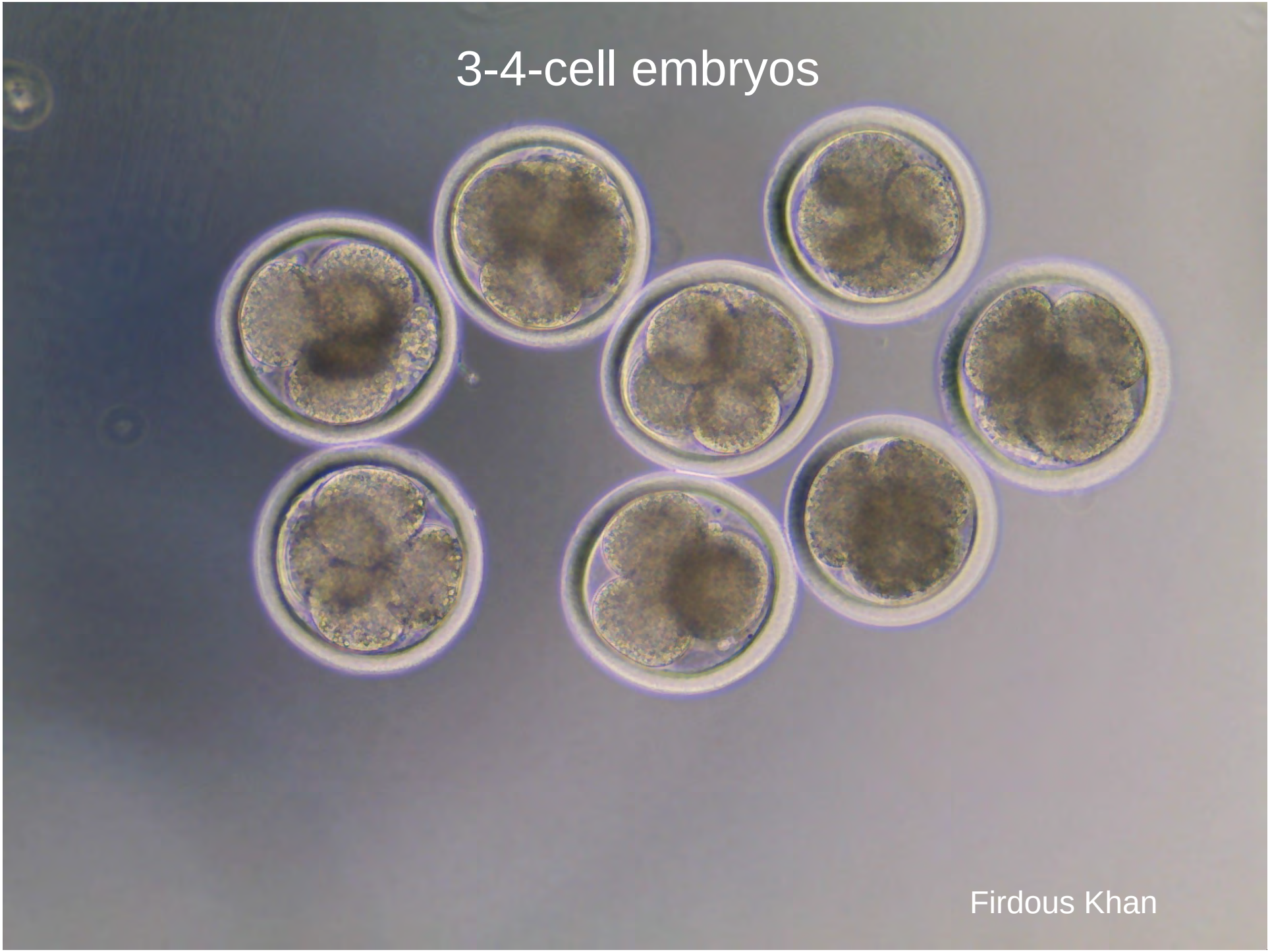


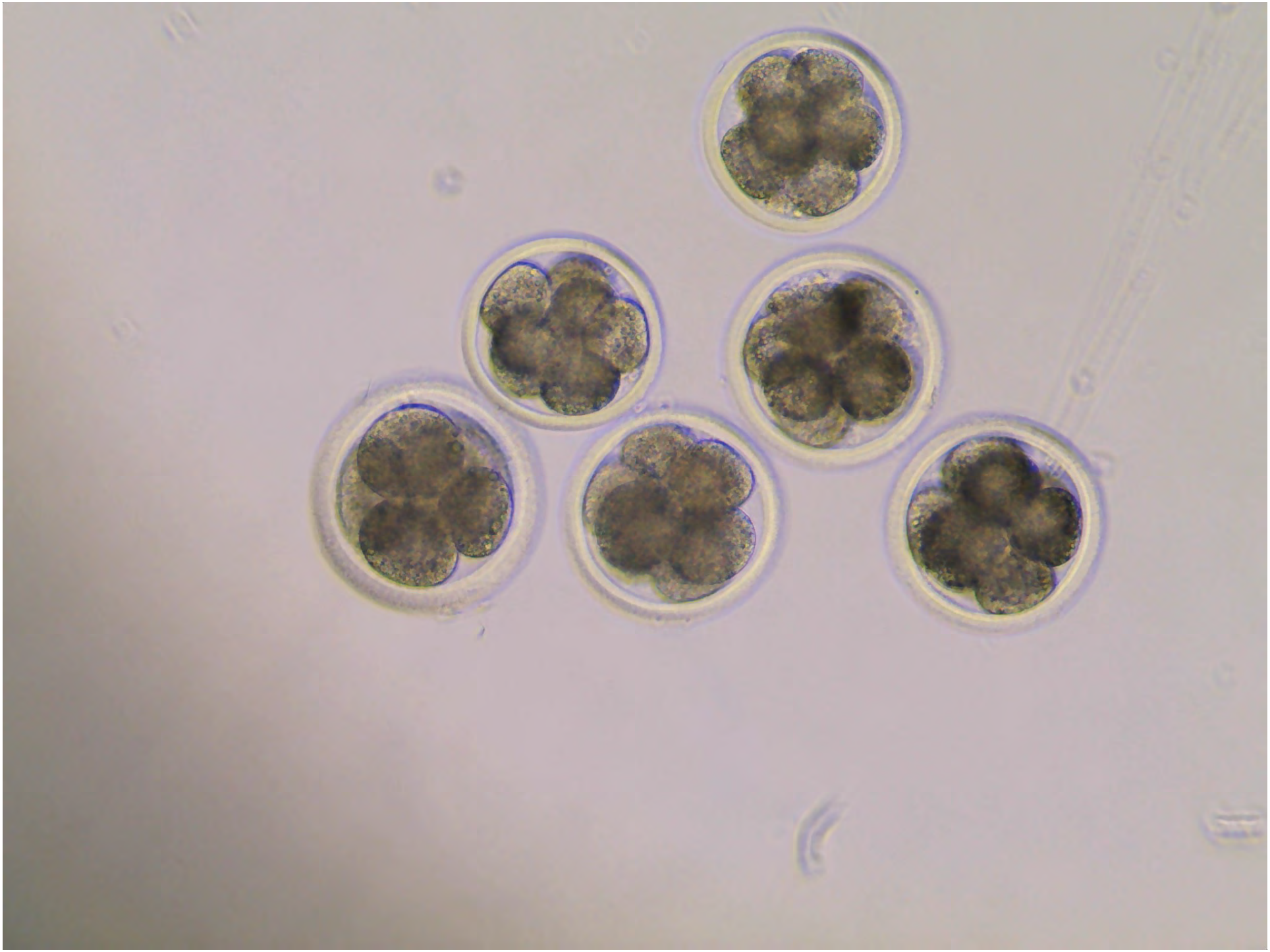
Firdous Khan



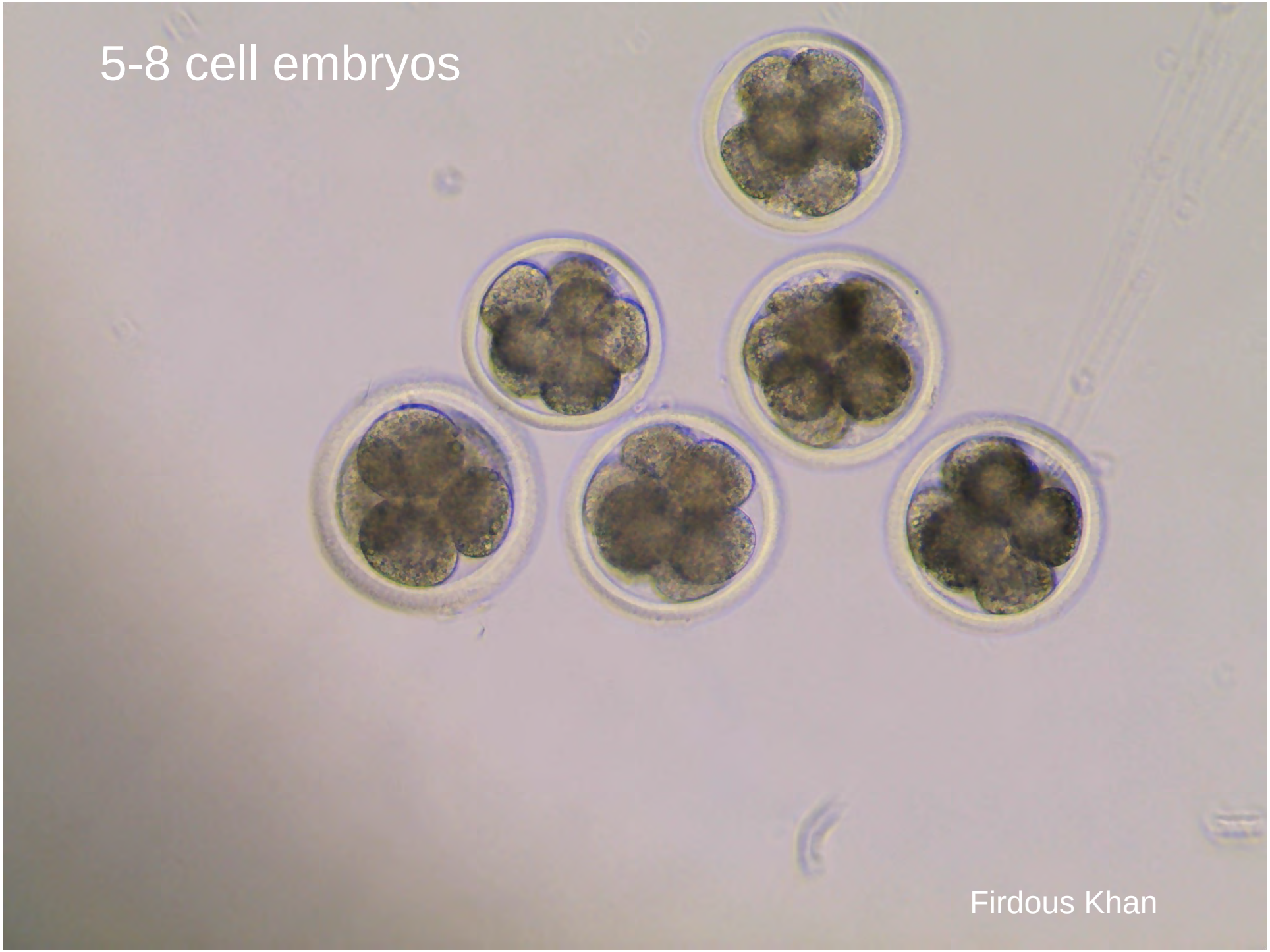
Two-cell Embryos



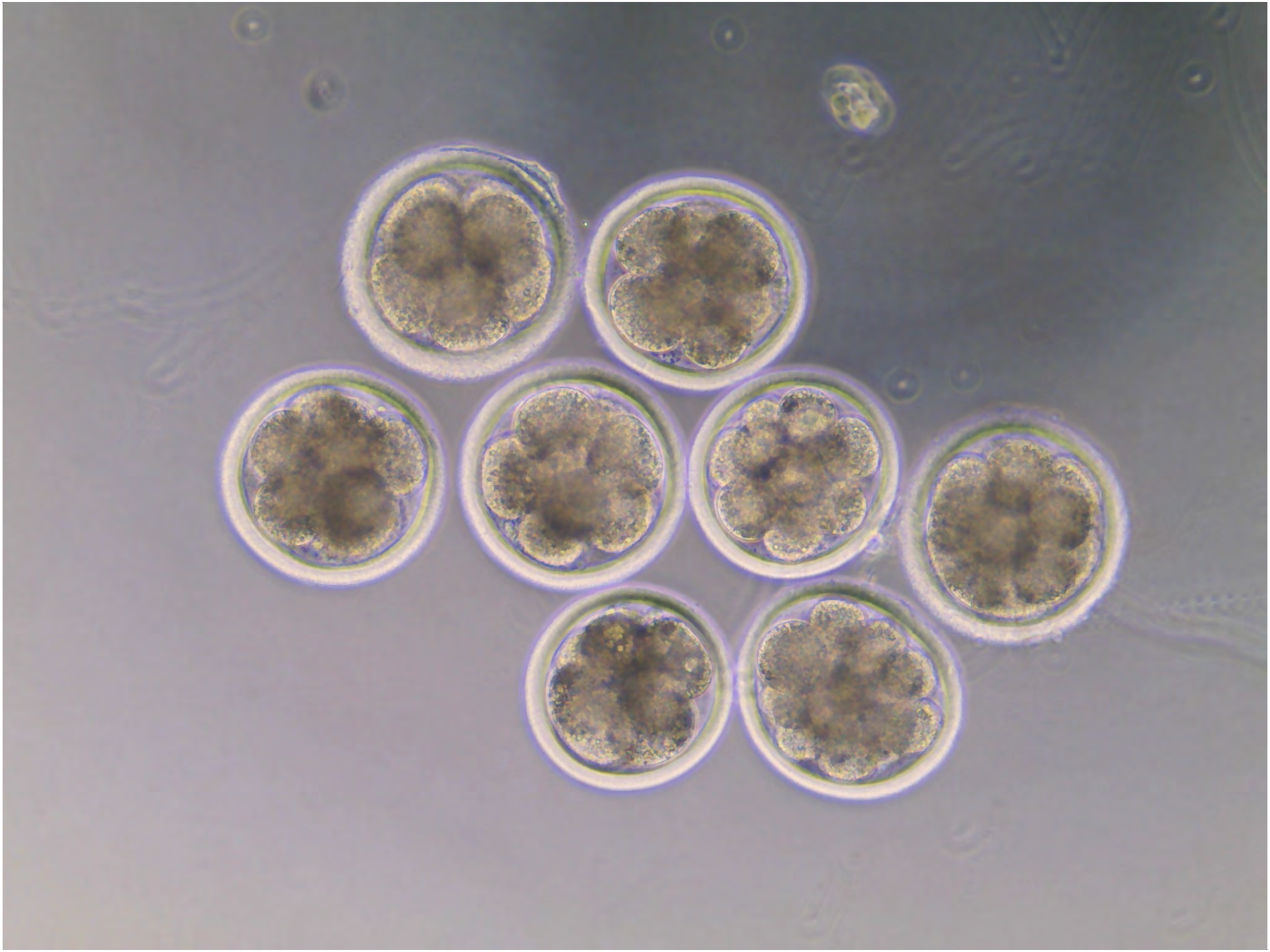

3-4-cell embryos
Firdous Khan



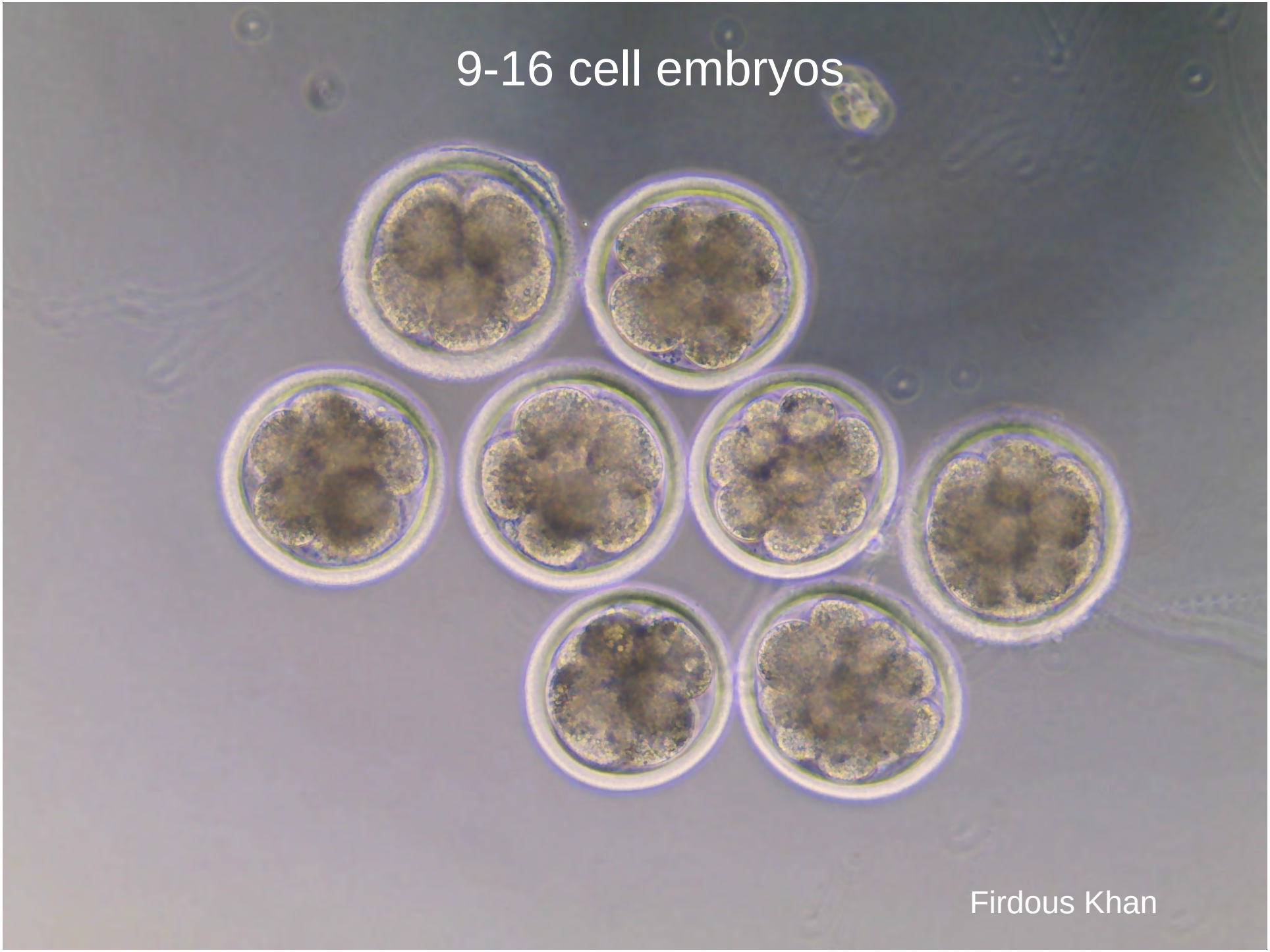
5-8 cell embryos



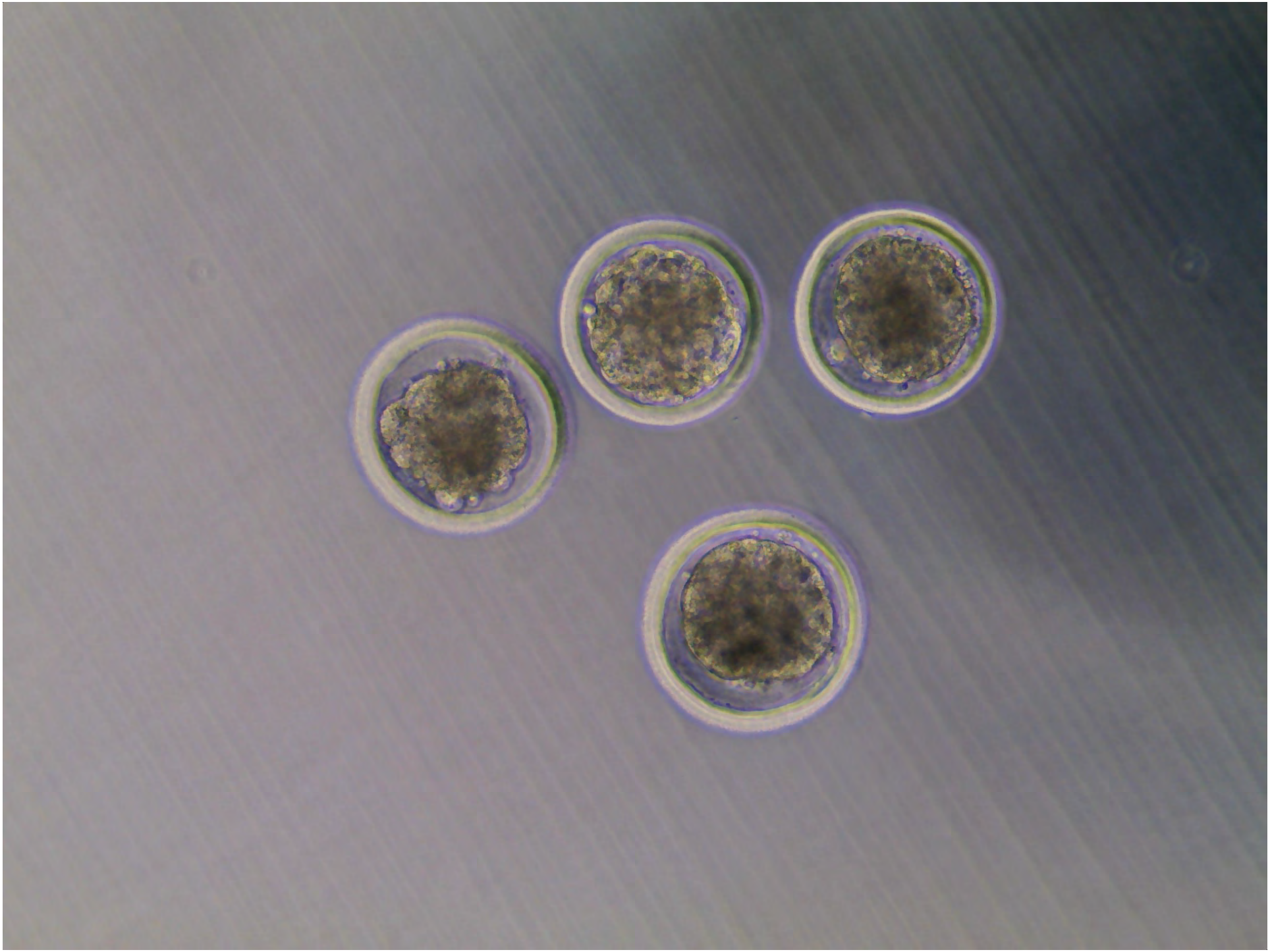
Firdous Khan

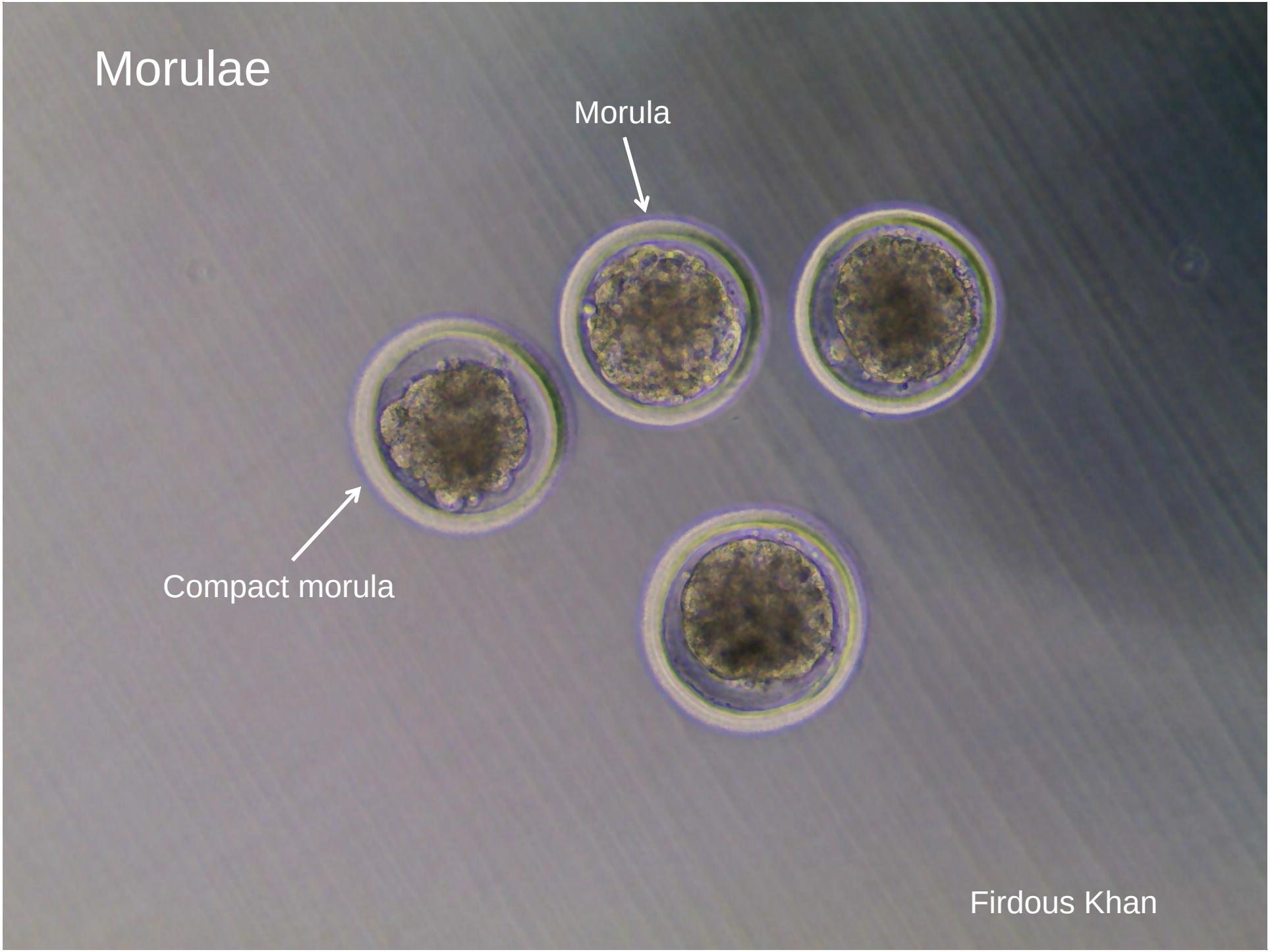


9-16 cell embryos

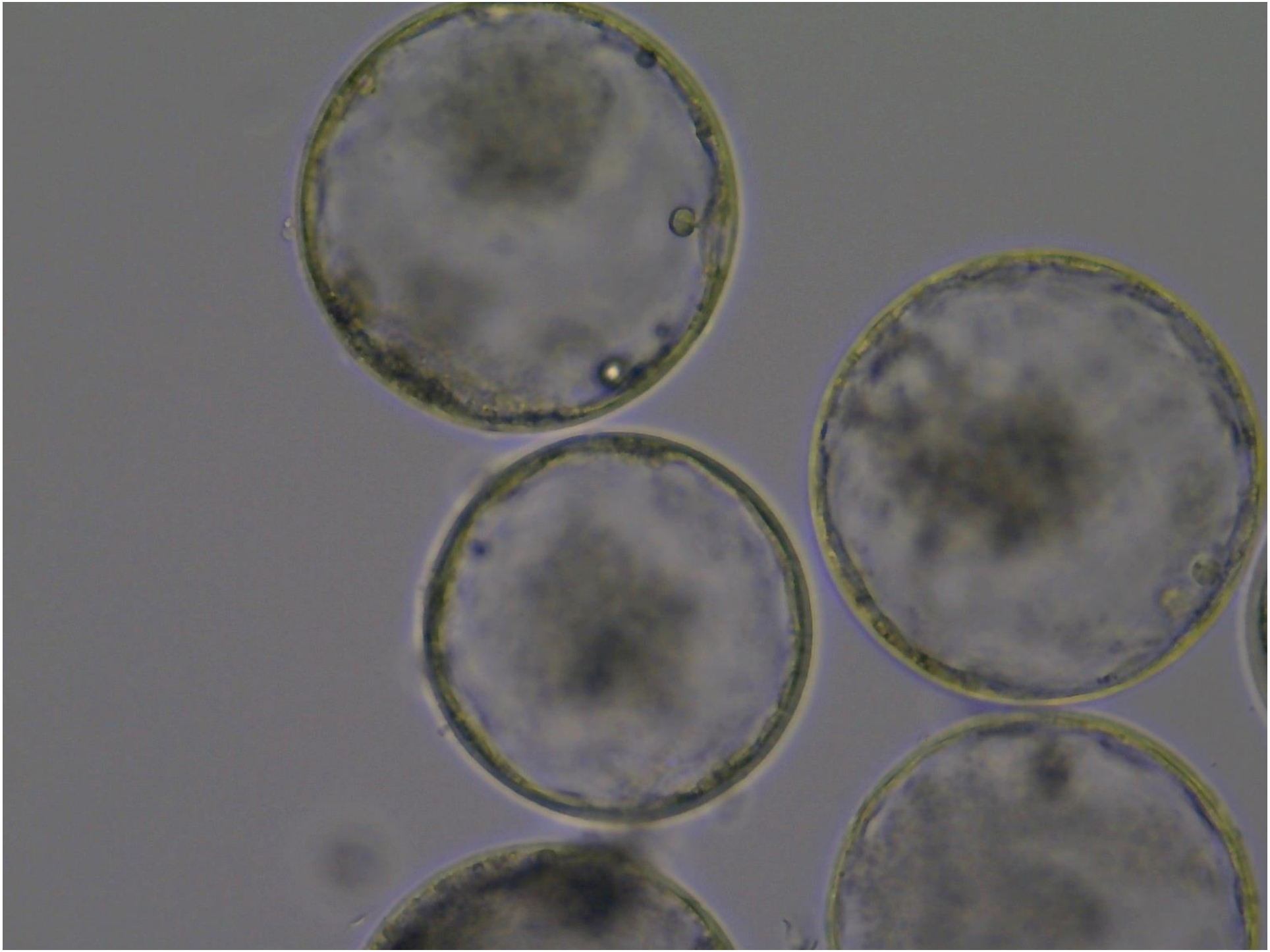


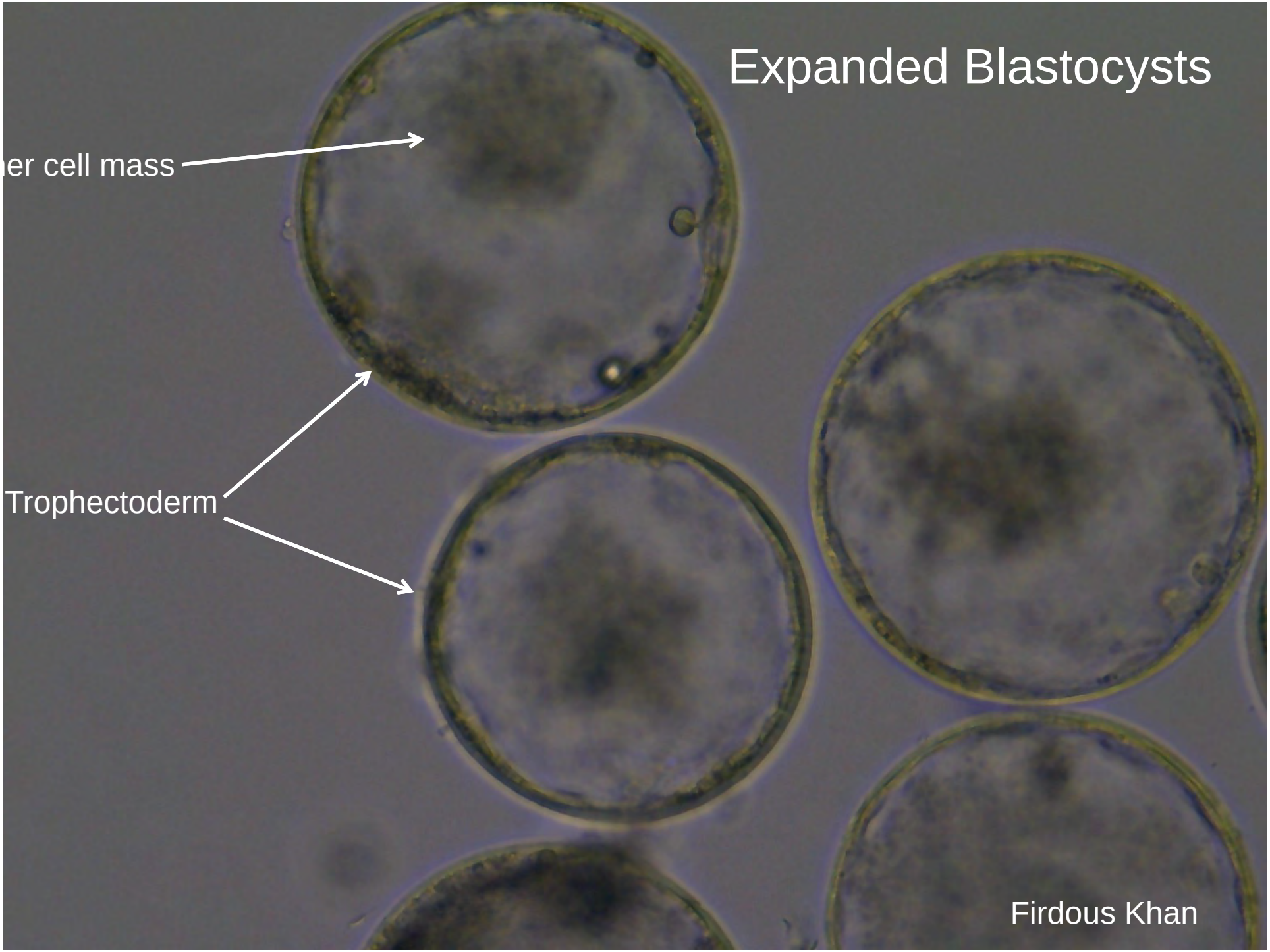
Firdous Khan

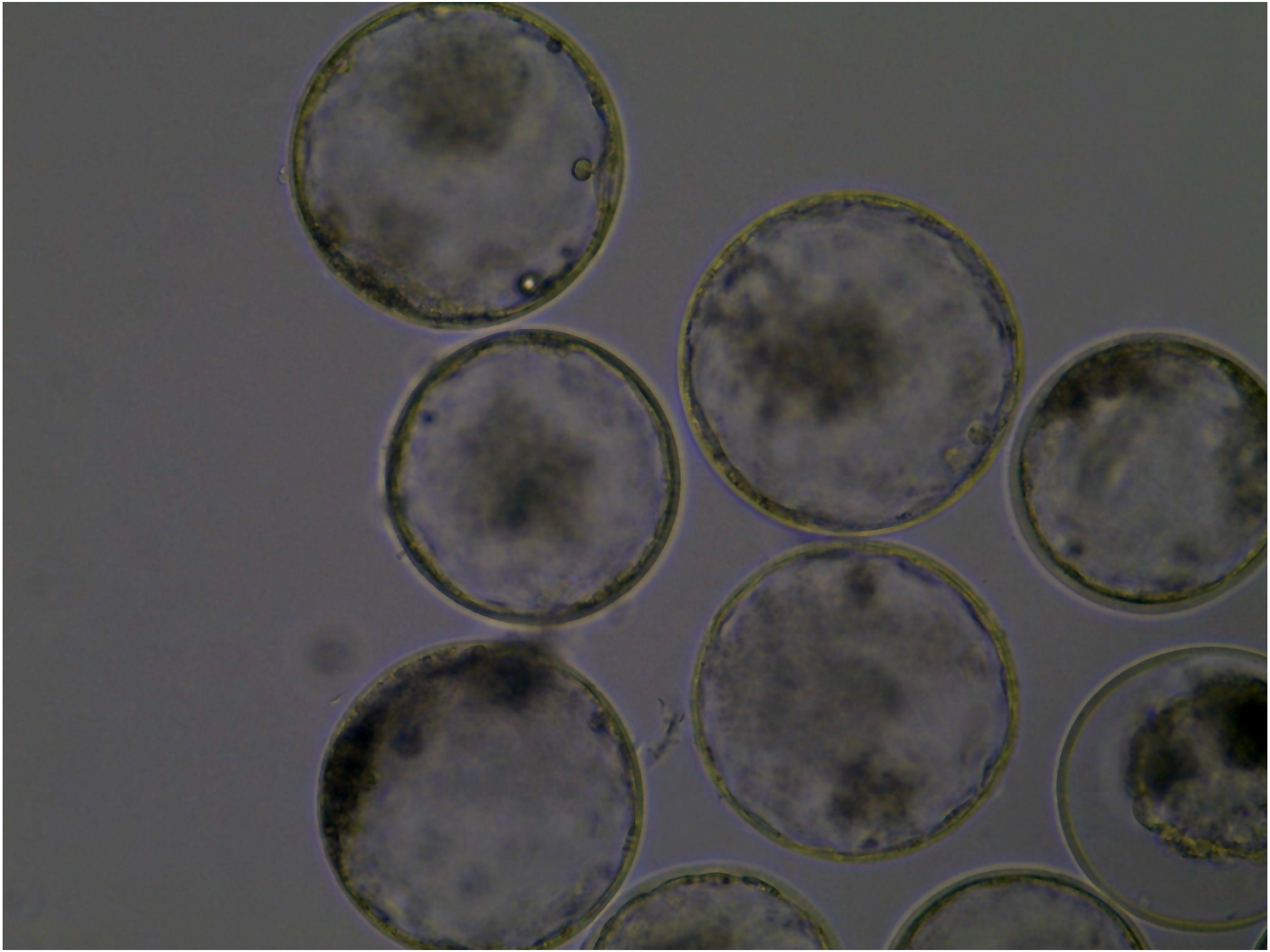



Morulae
Morula
Compact morula
Firdous Khan

Blastocysts

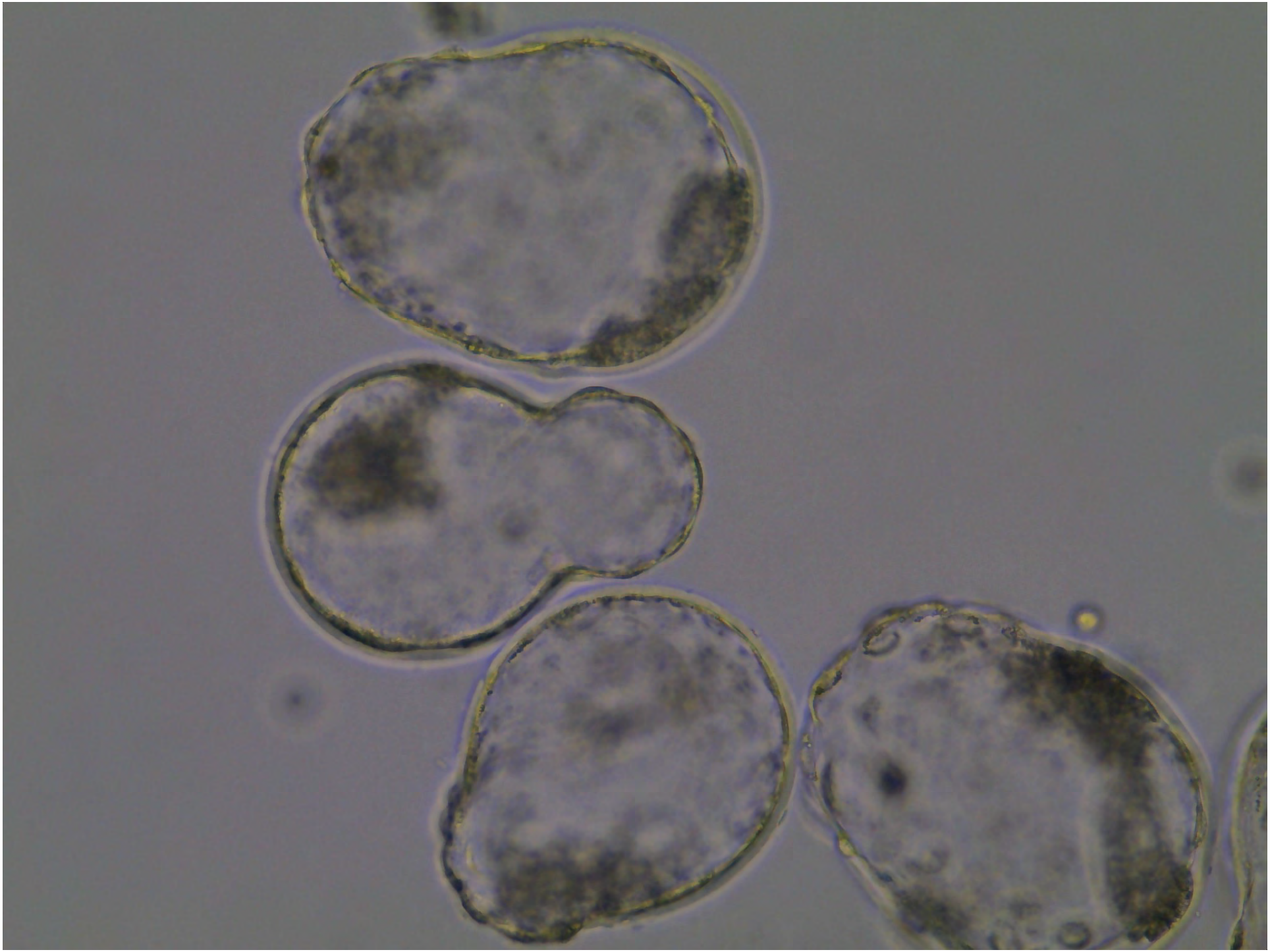



Expanded Blastocysts
er cell mass
Trophectoderm
Firdous Khan



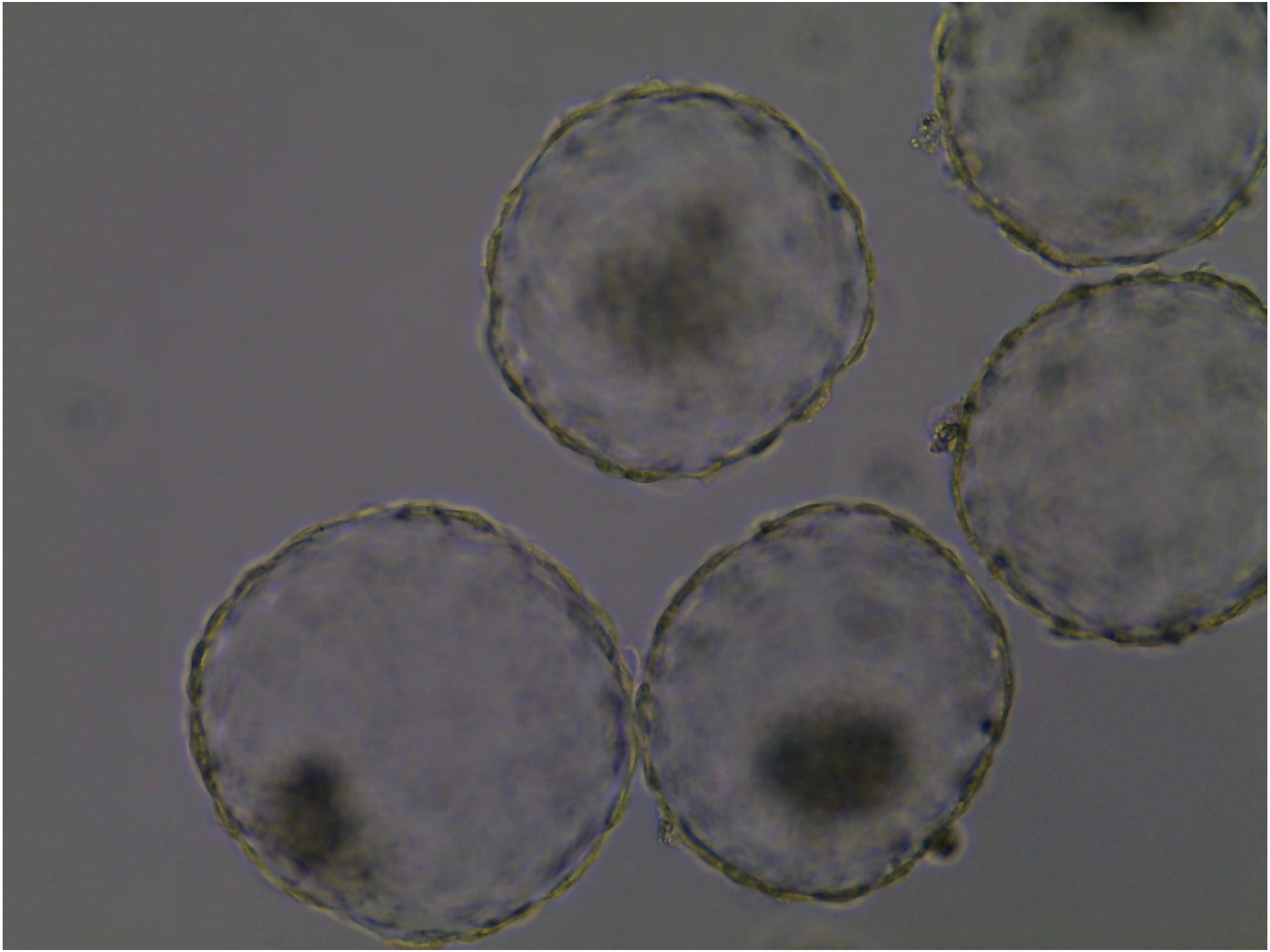
Expanded blastocysts

Firdous Khan



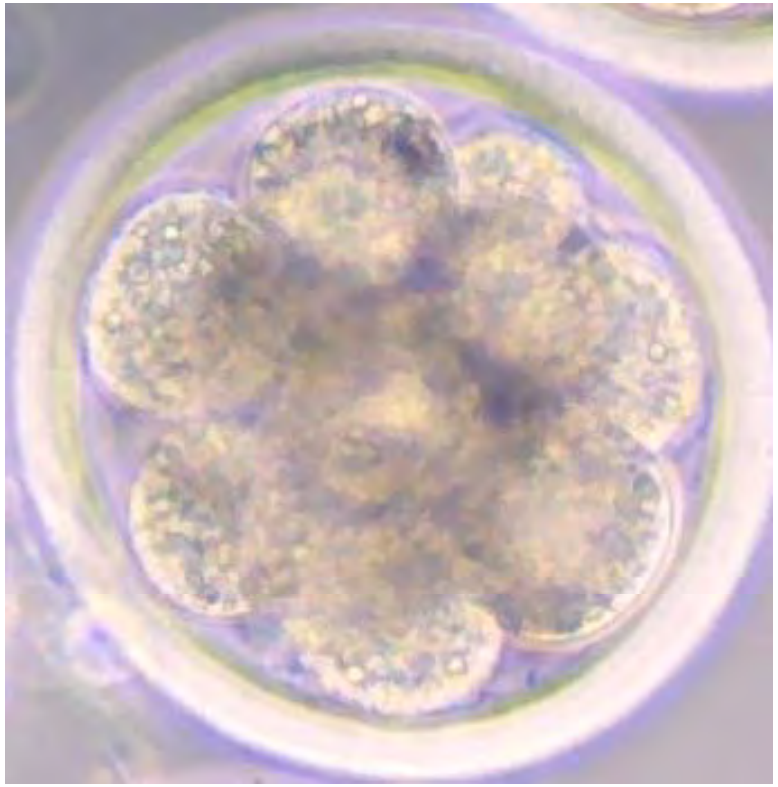
Hatching Blastocysts

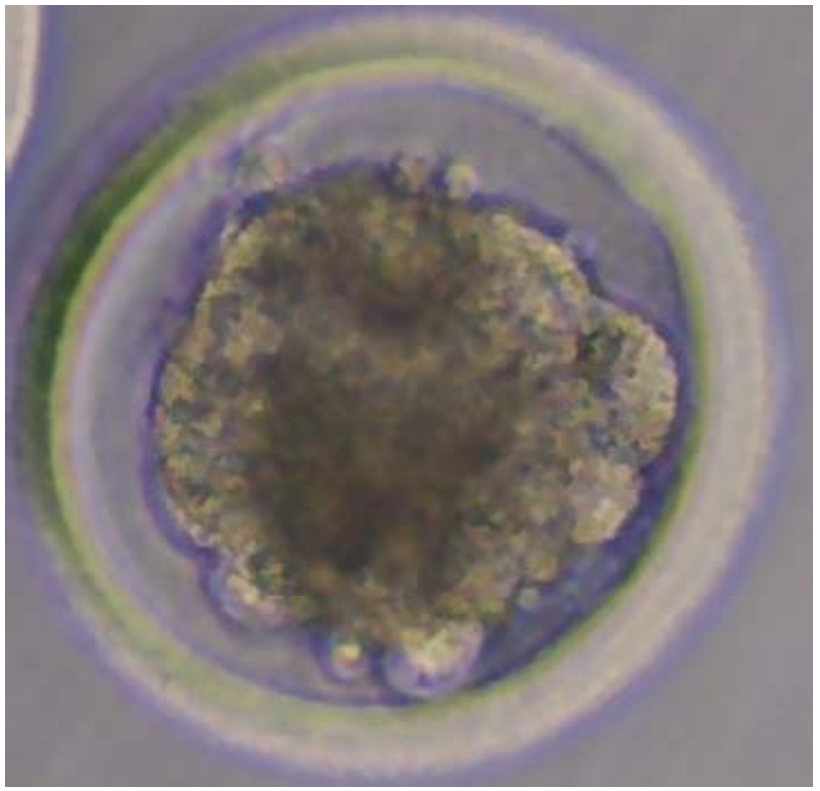
Firdous Khan



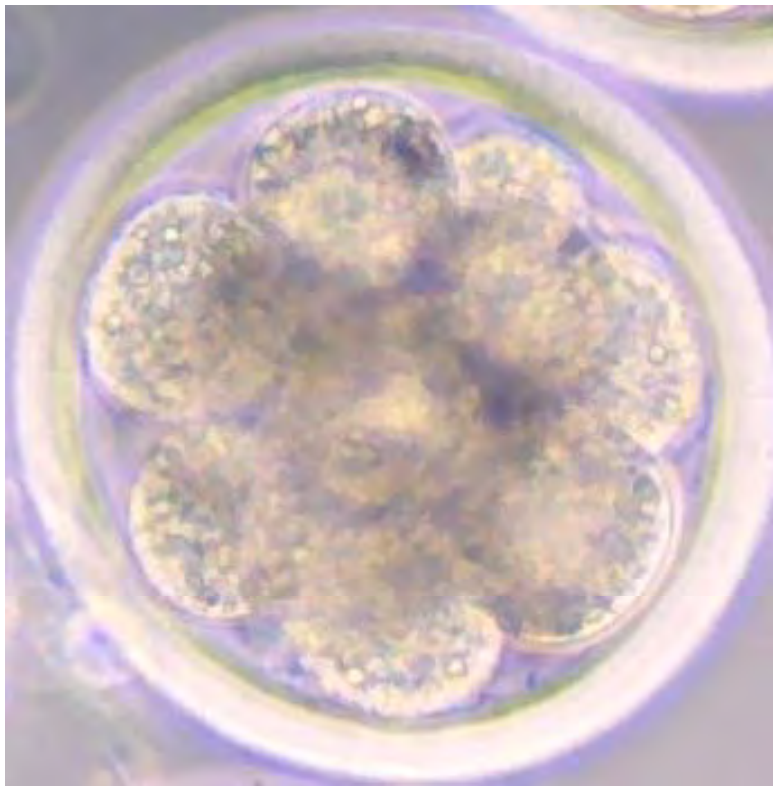

Hatched Blastocysts
Firdous Khan

Random images to help hone your skills at embryo identification

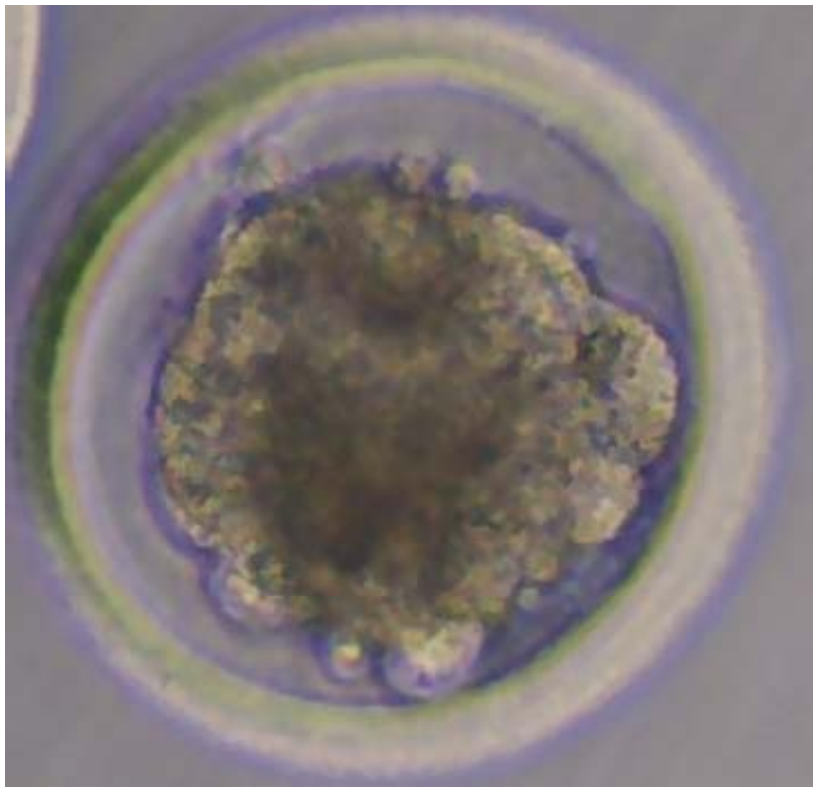




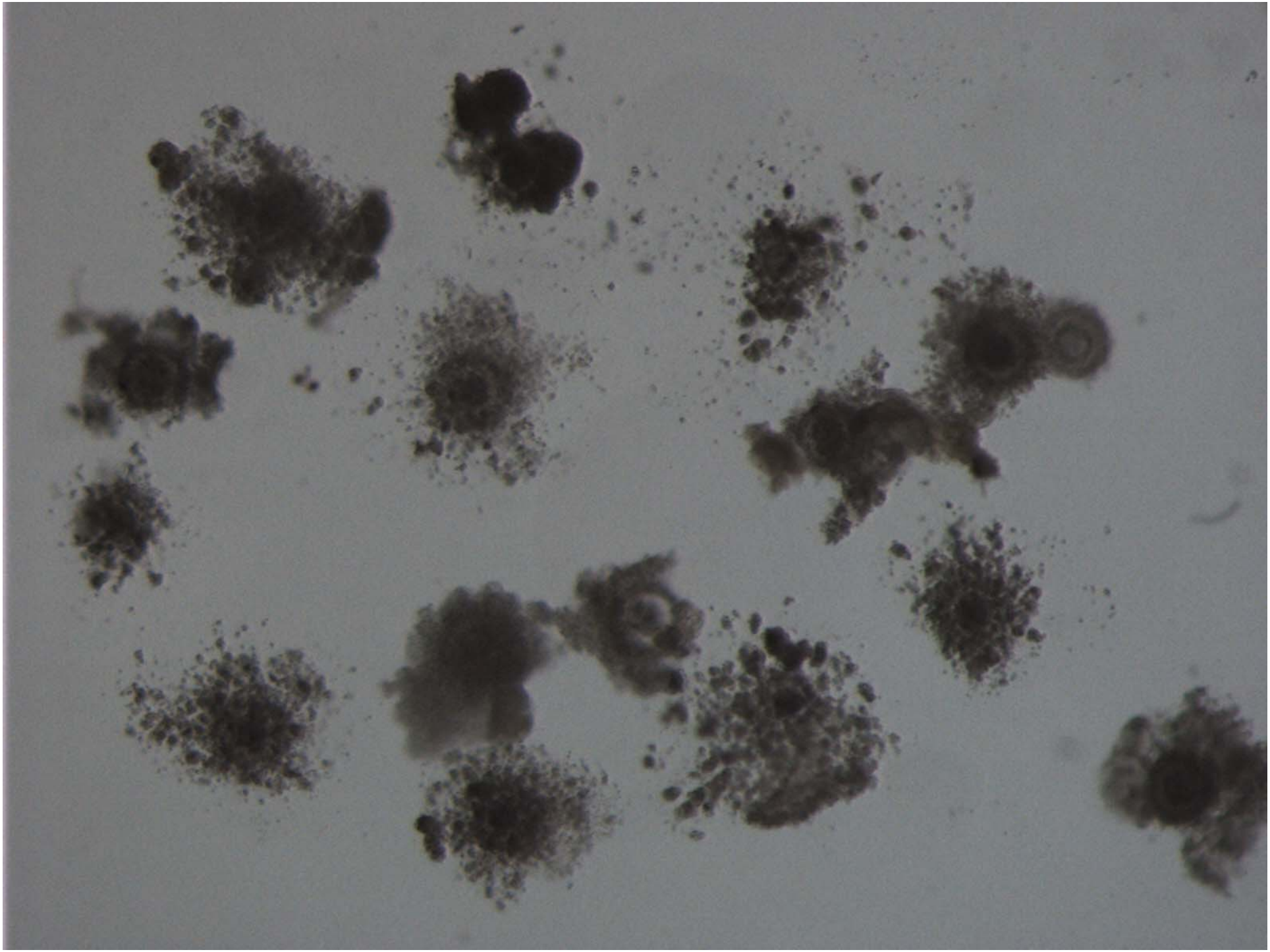
Embryo about 12-cells



Morula

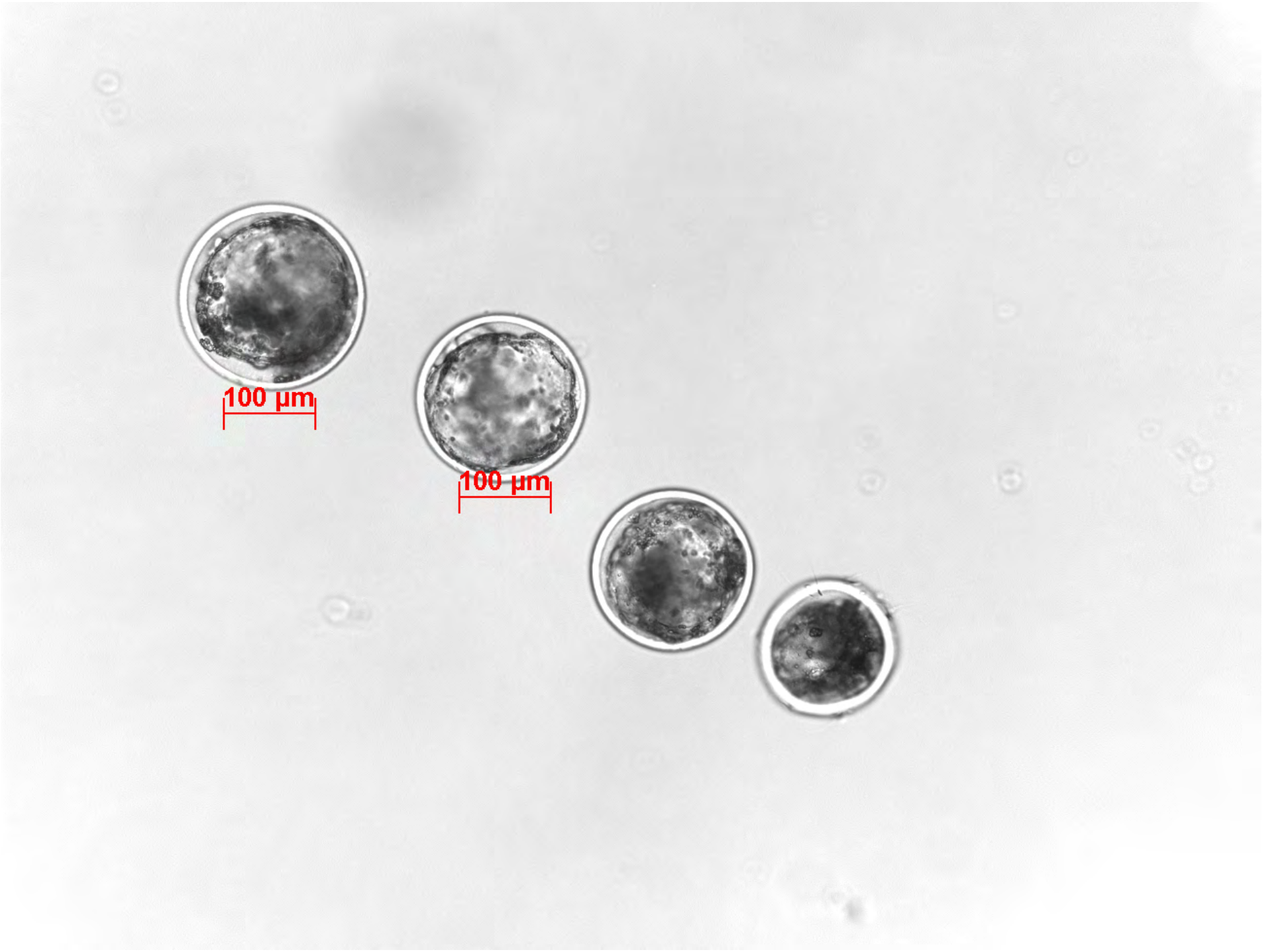


Firdous Khan

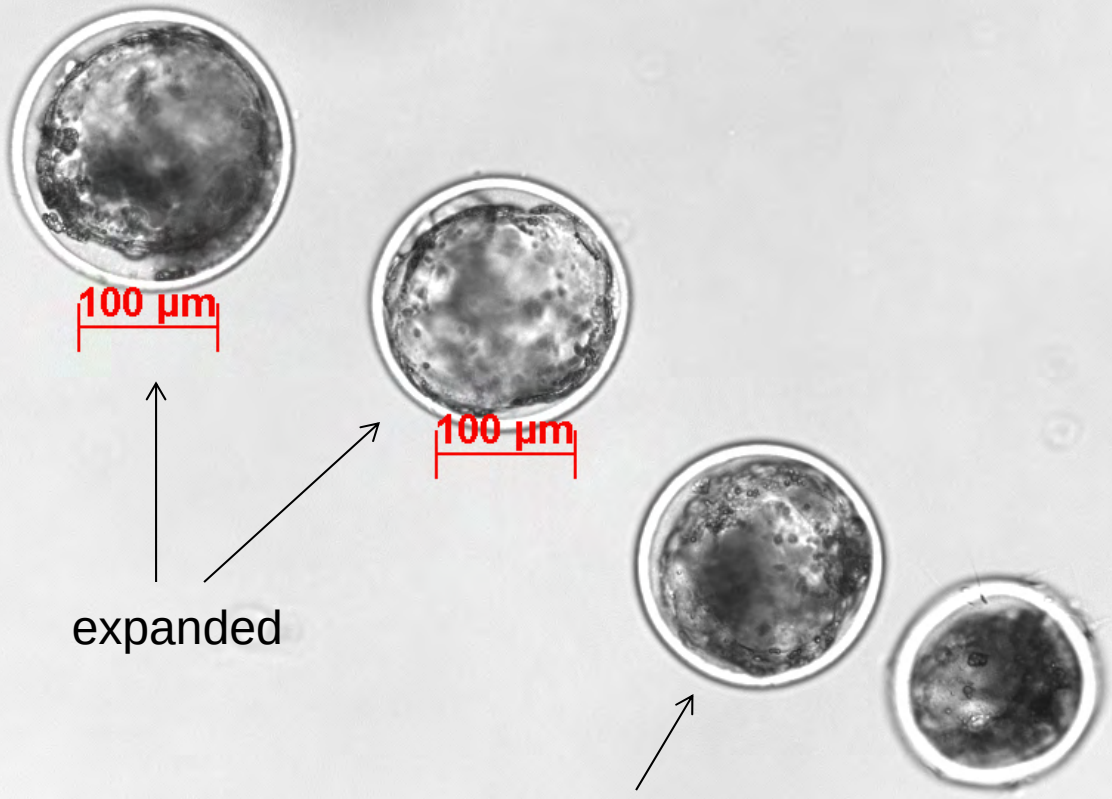


A Collection of Oocytes at the End of Maturation

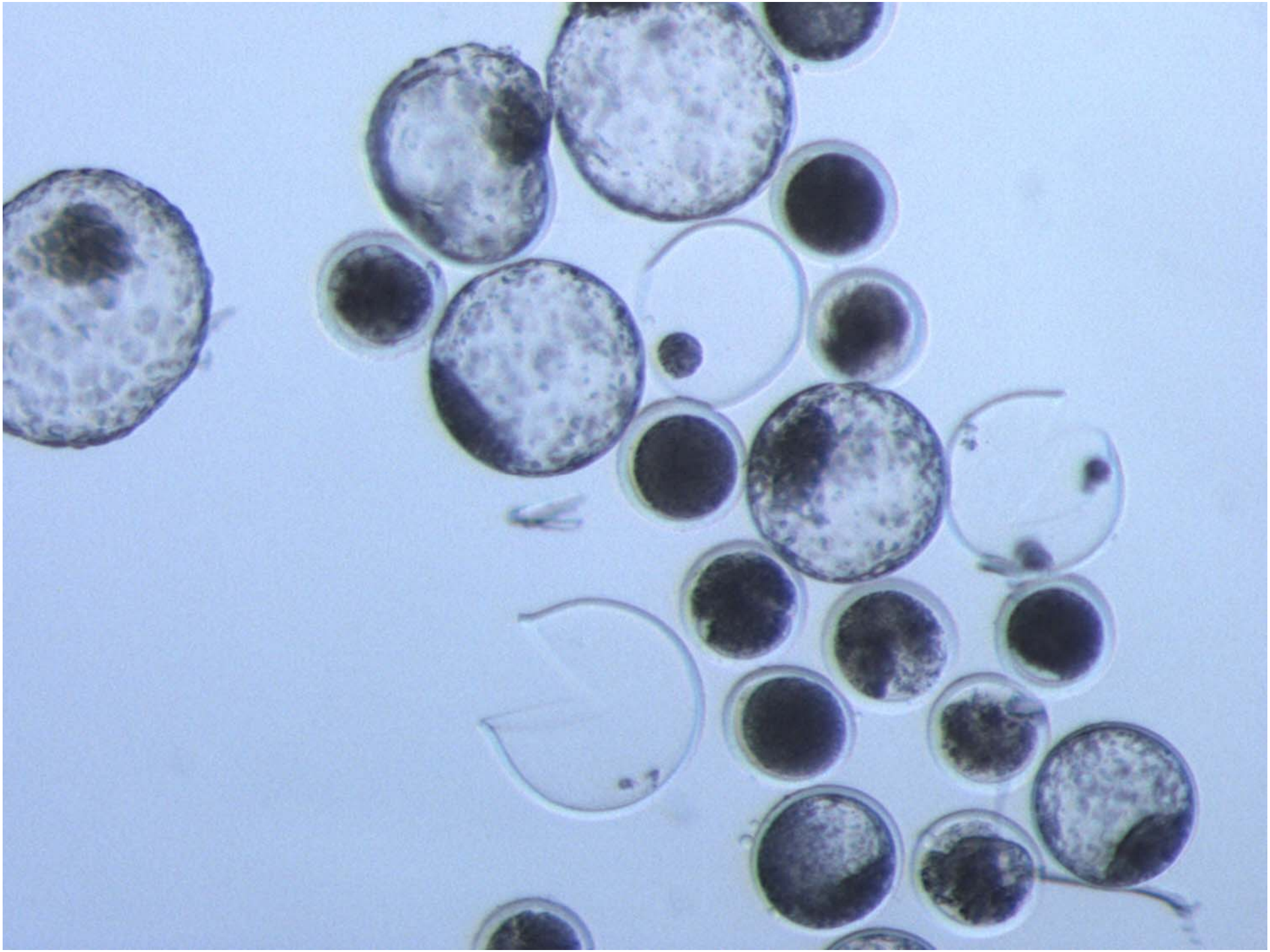
Aline Bonilla

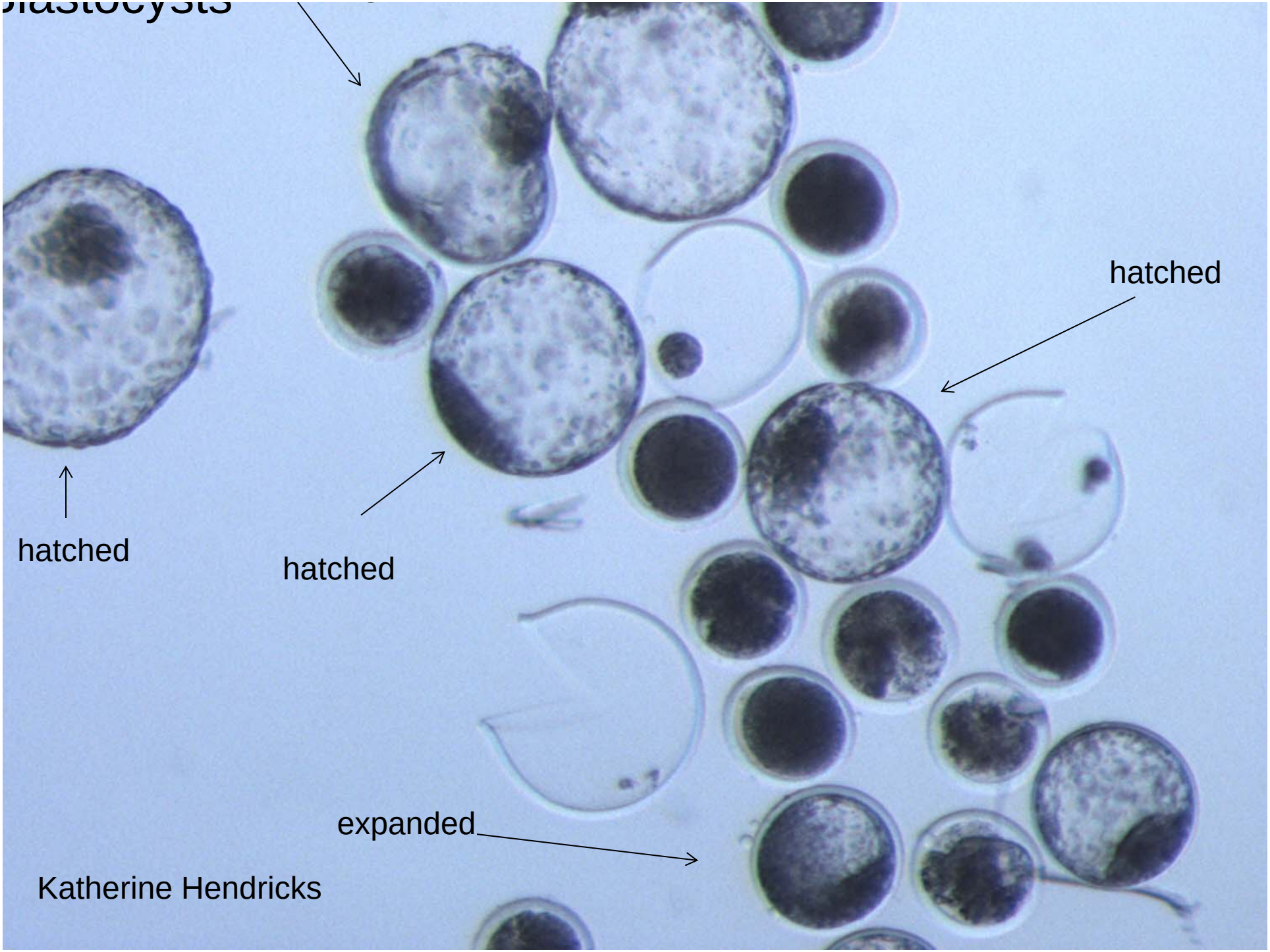

100 µm
100 µm

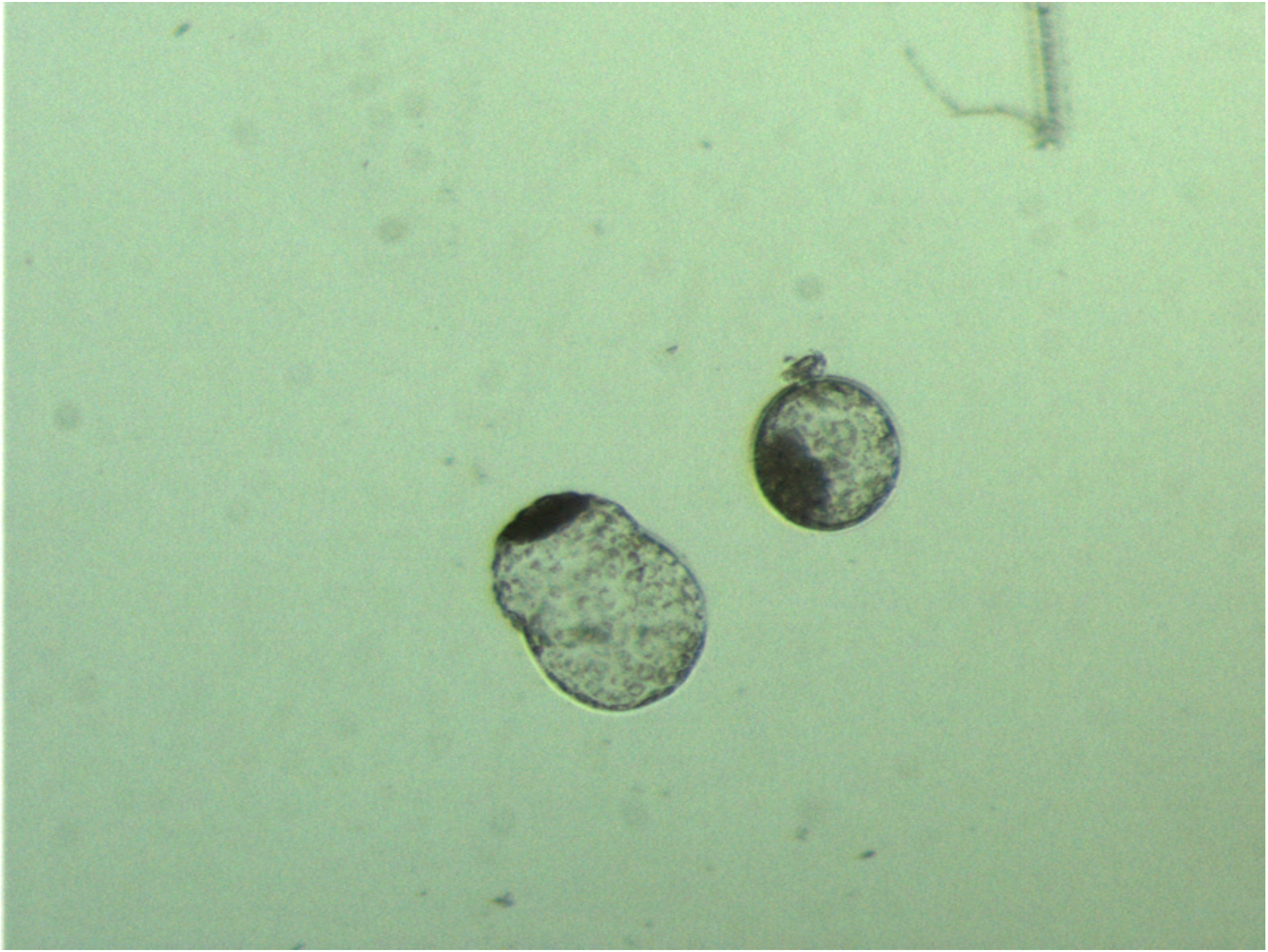
Blastocysts



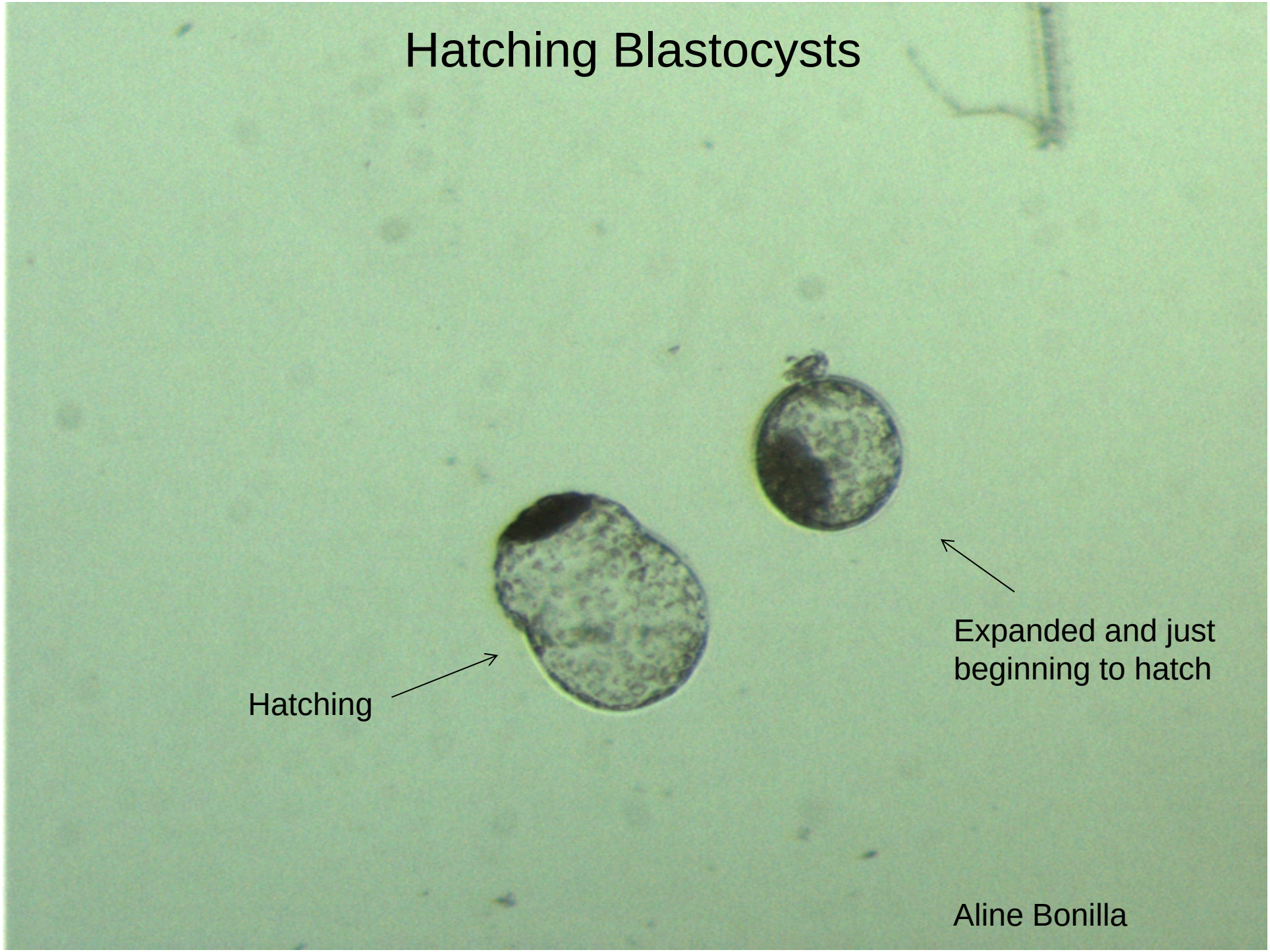
Amber Brad

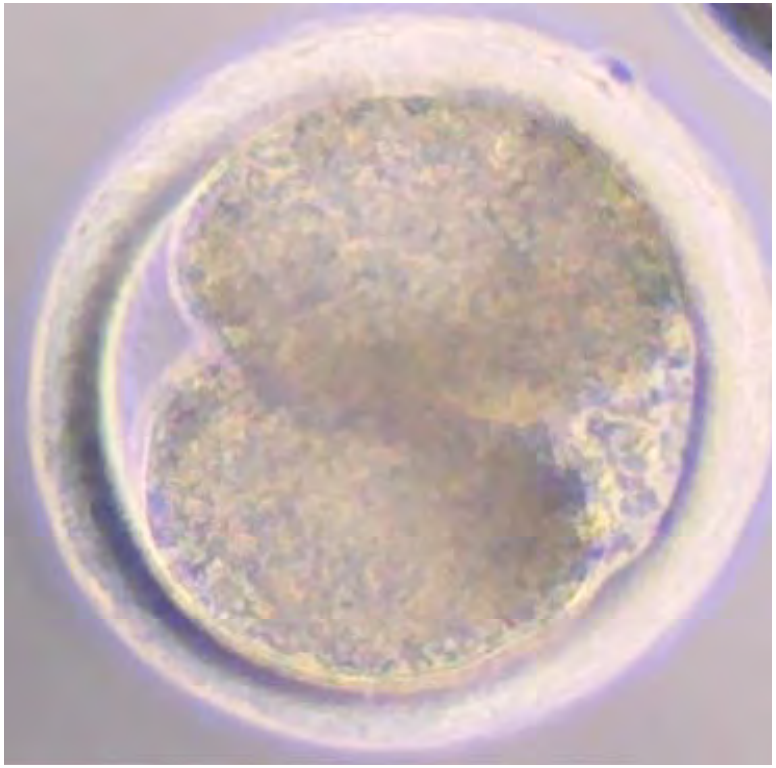


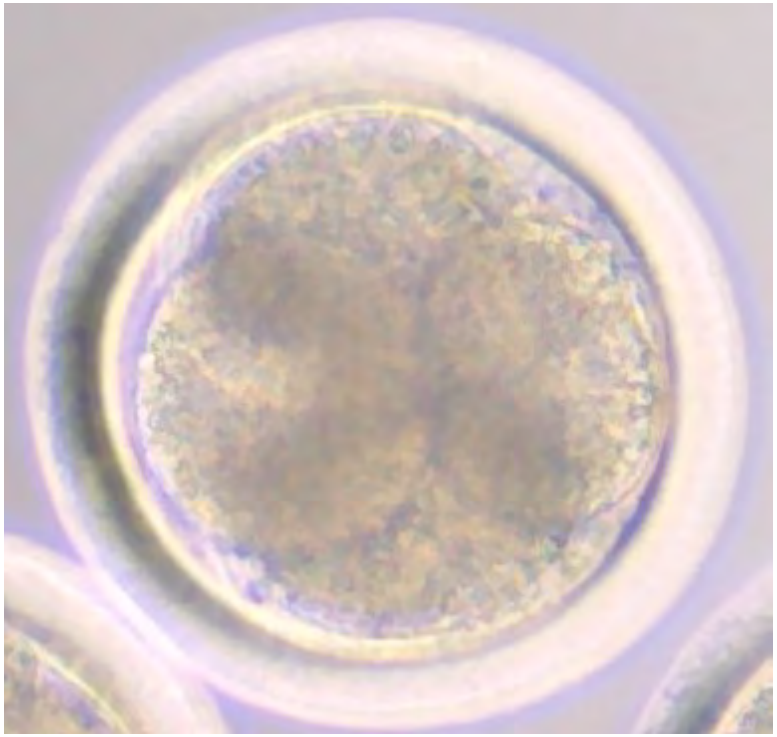

hatched
hatched
hatched
expanded
Katherine Hendricks



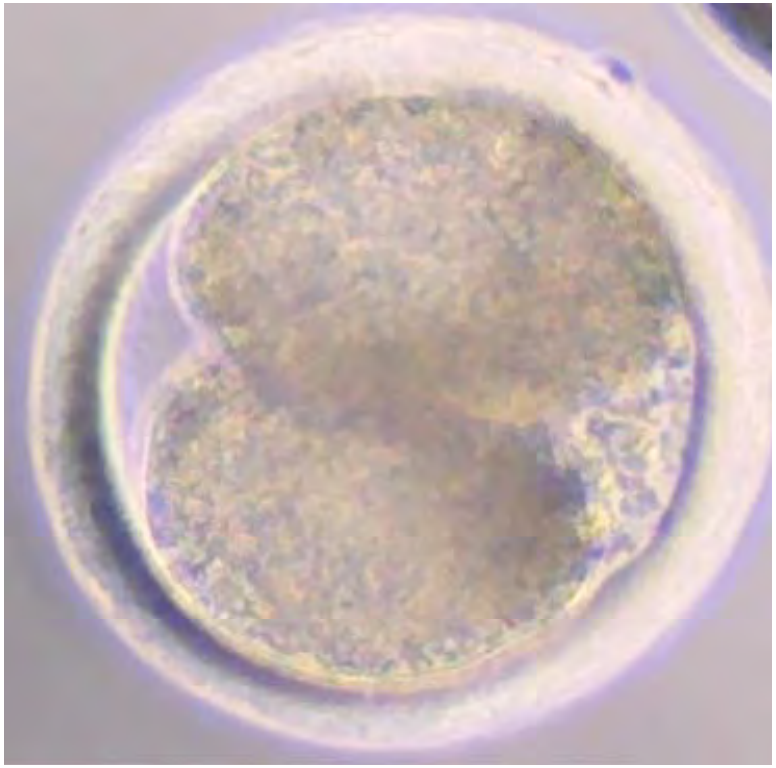
Hatching Blastocysts



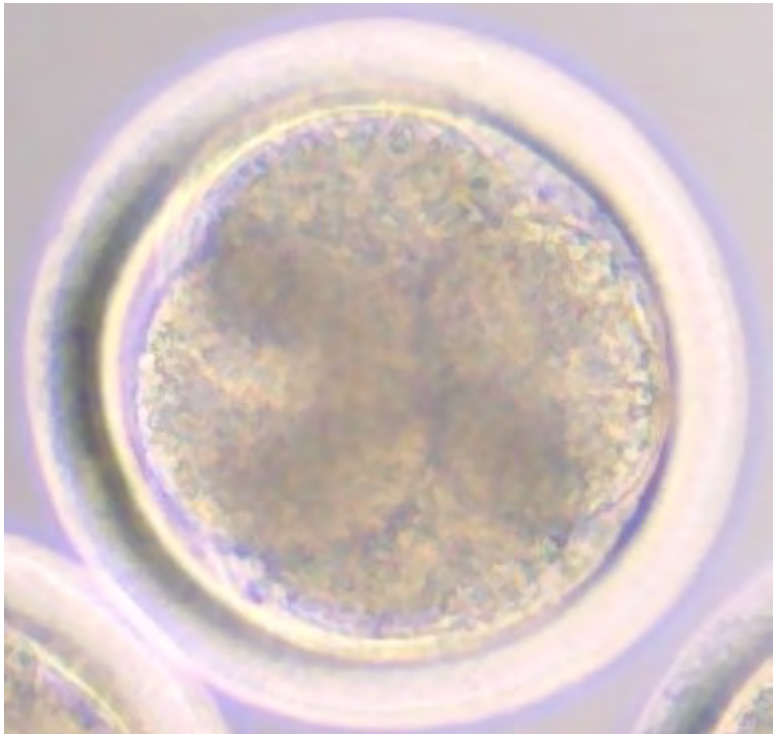




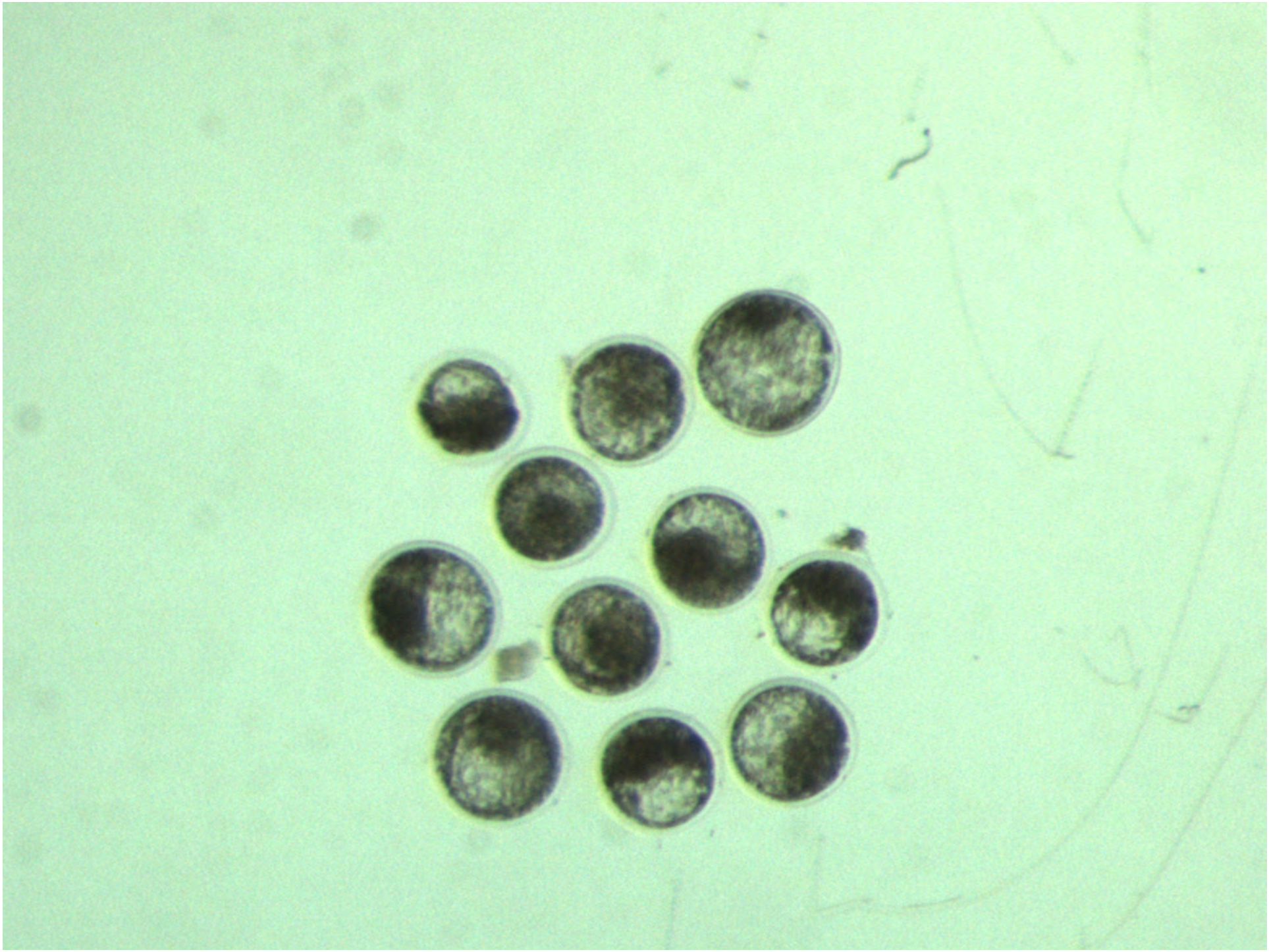
Two-cell embryo



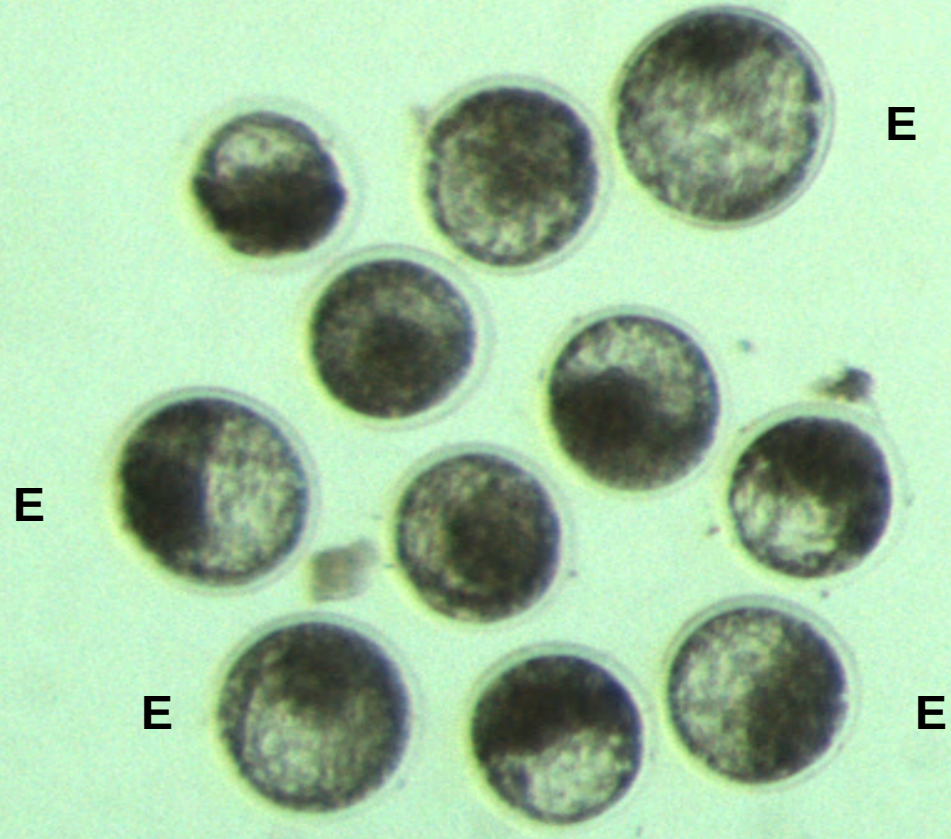
Four-cell embryo



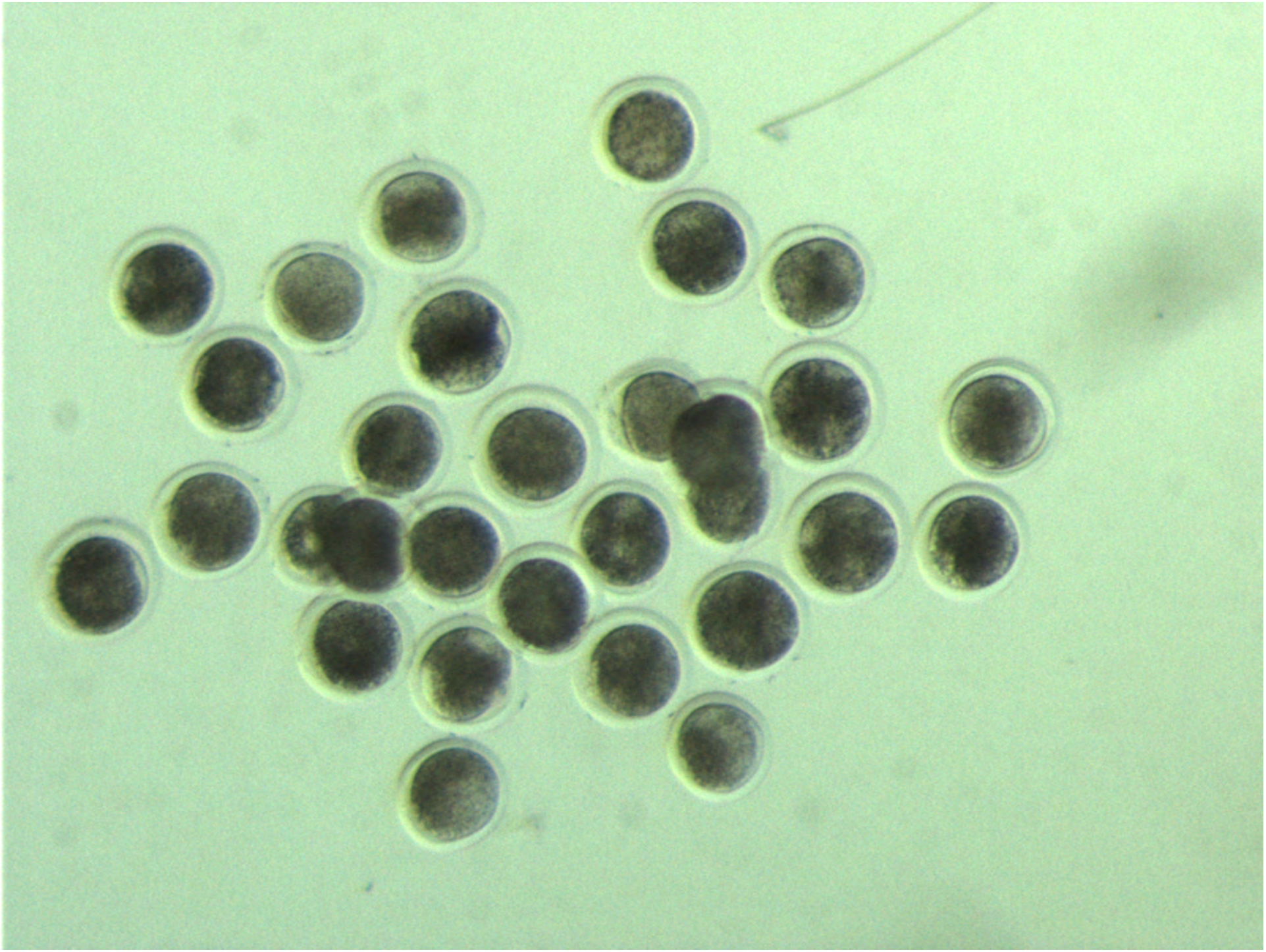
Firdous Khan



Blastocysts
expanded are labeled with E

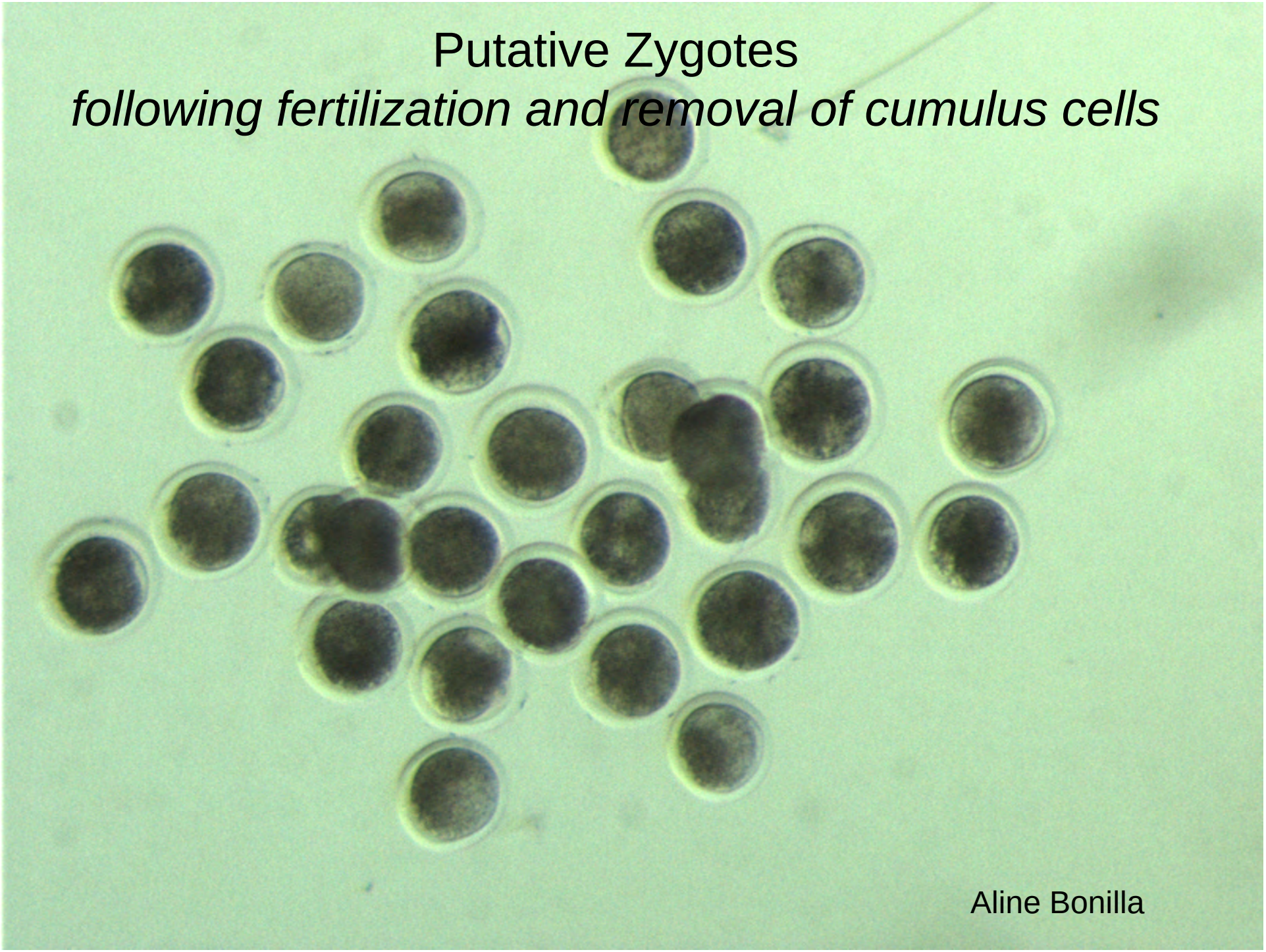


Aline Bonilla

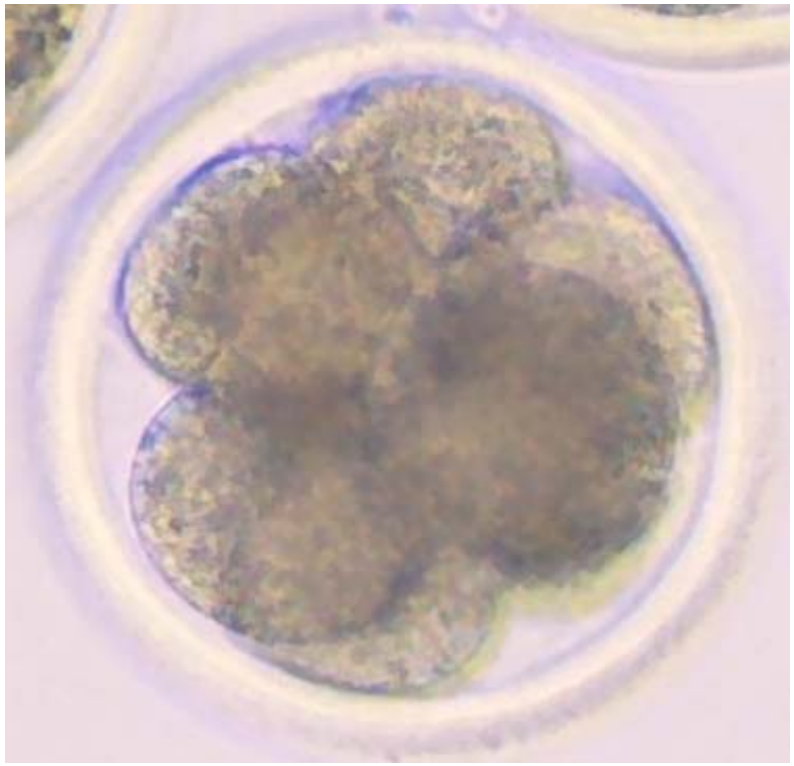


Putative Zygotes

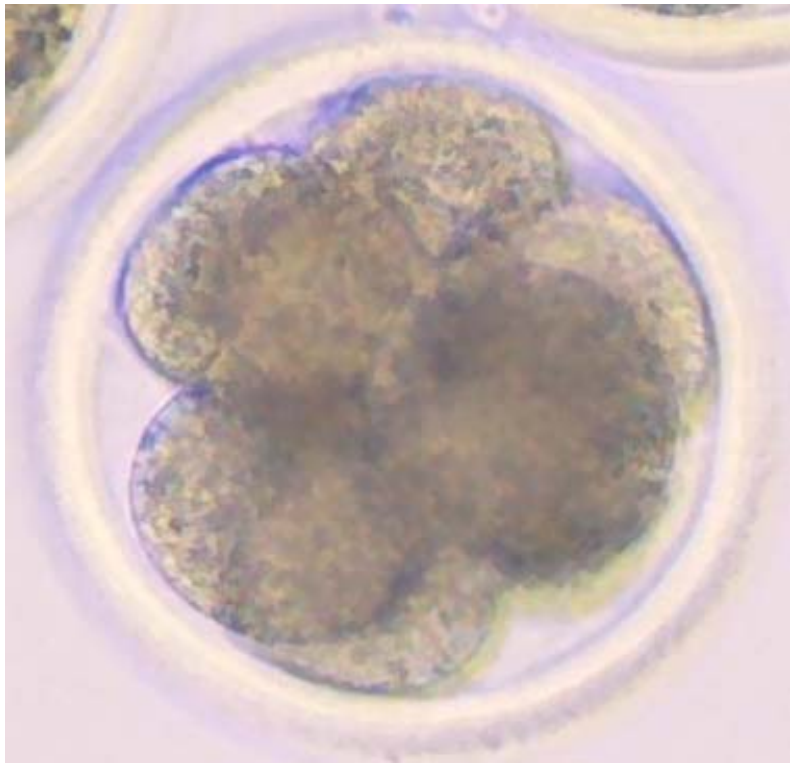
following fertilization and removal of cumulus cells



Aline Bonilla

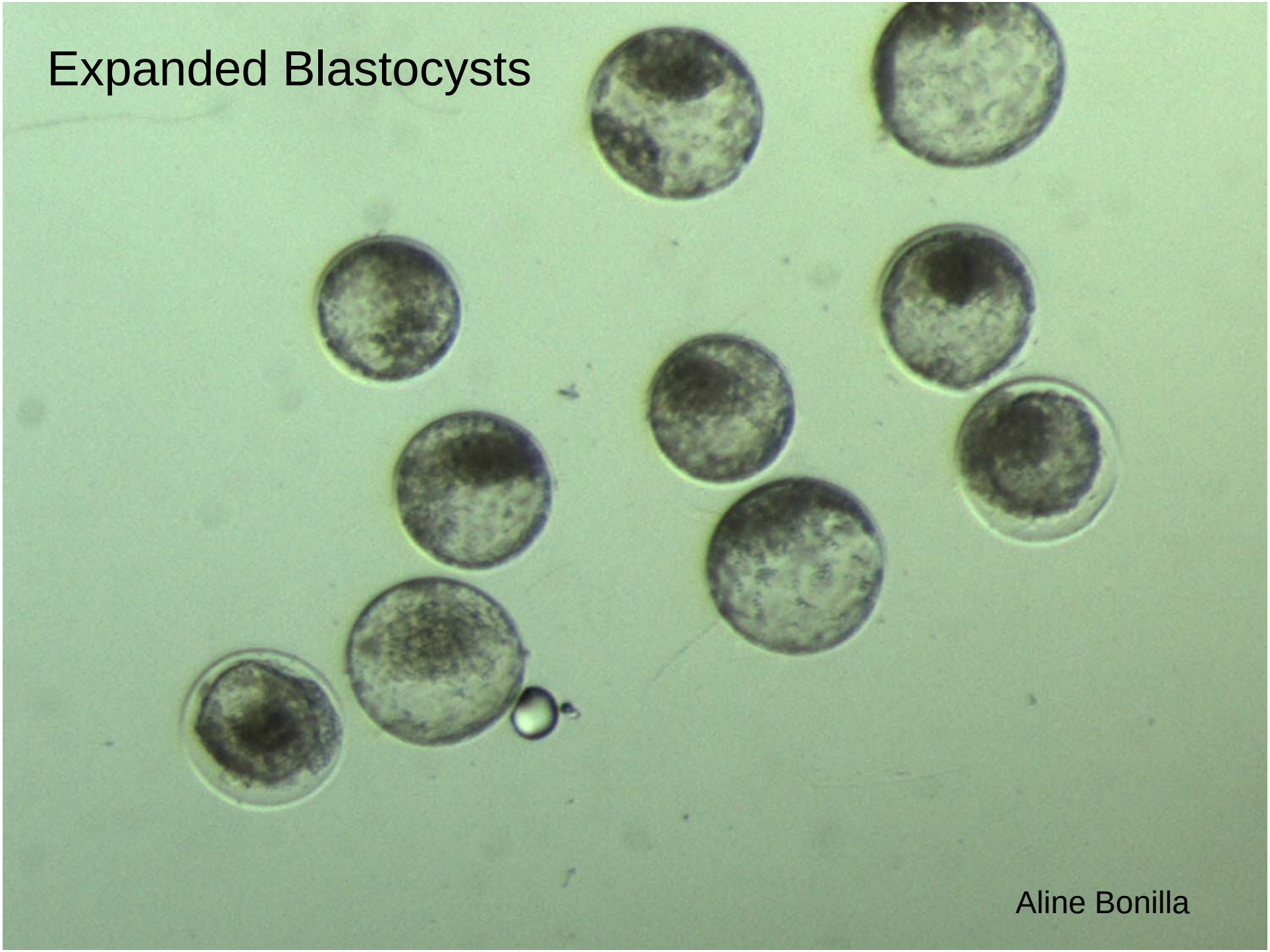


Eight-cell embryo

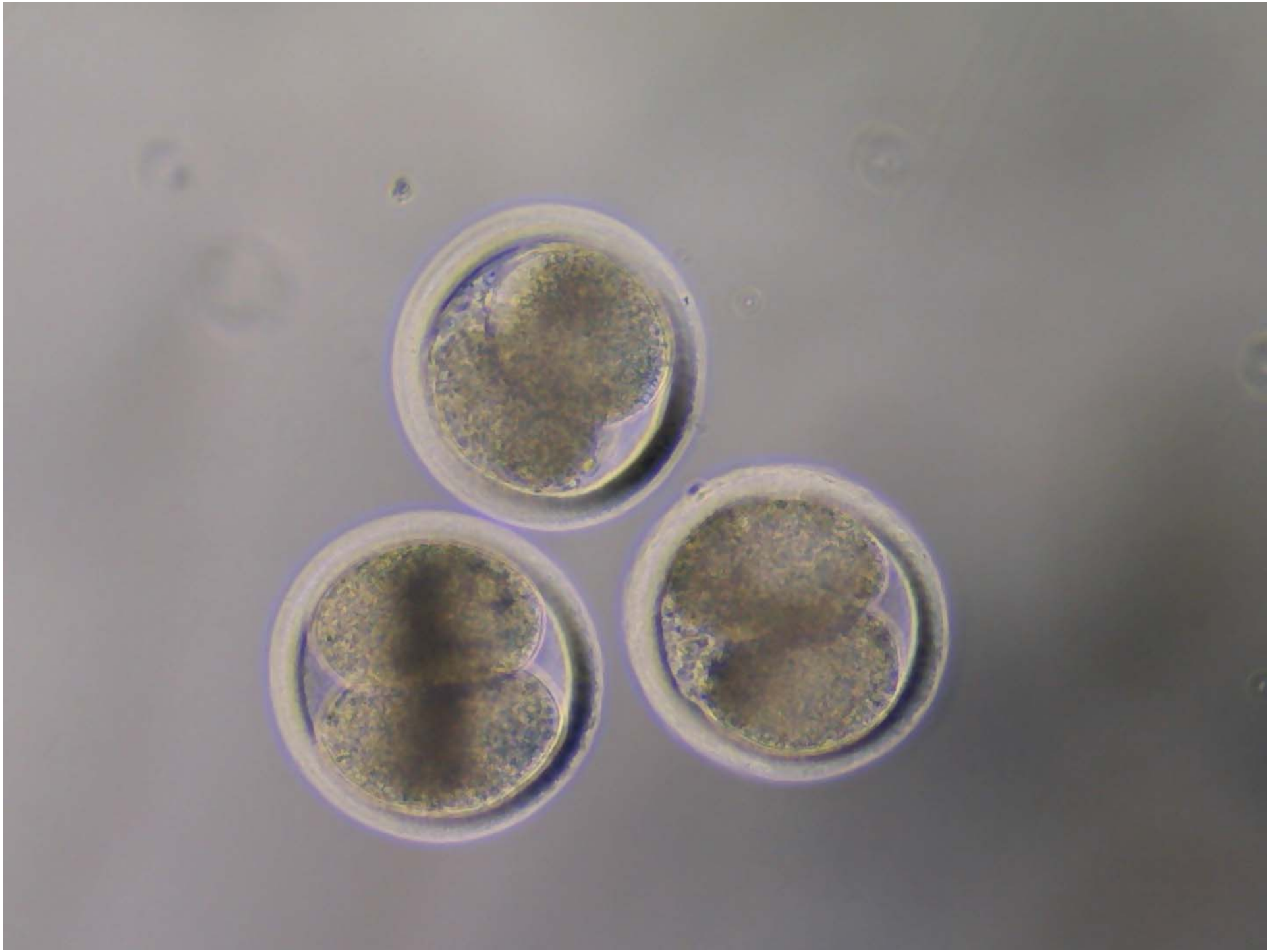


Firdous Khan

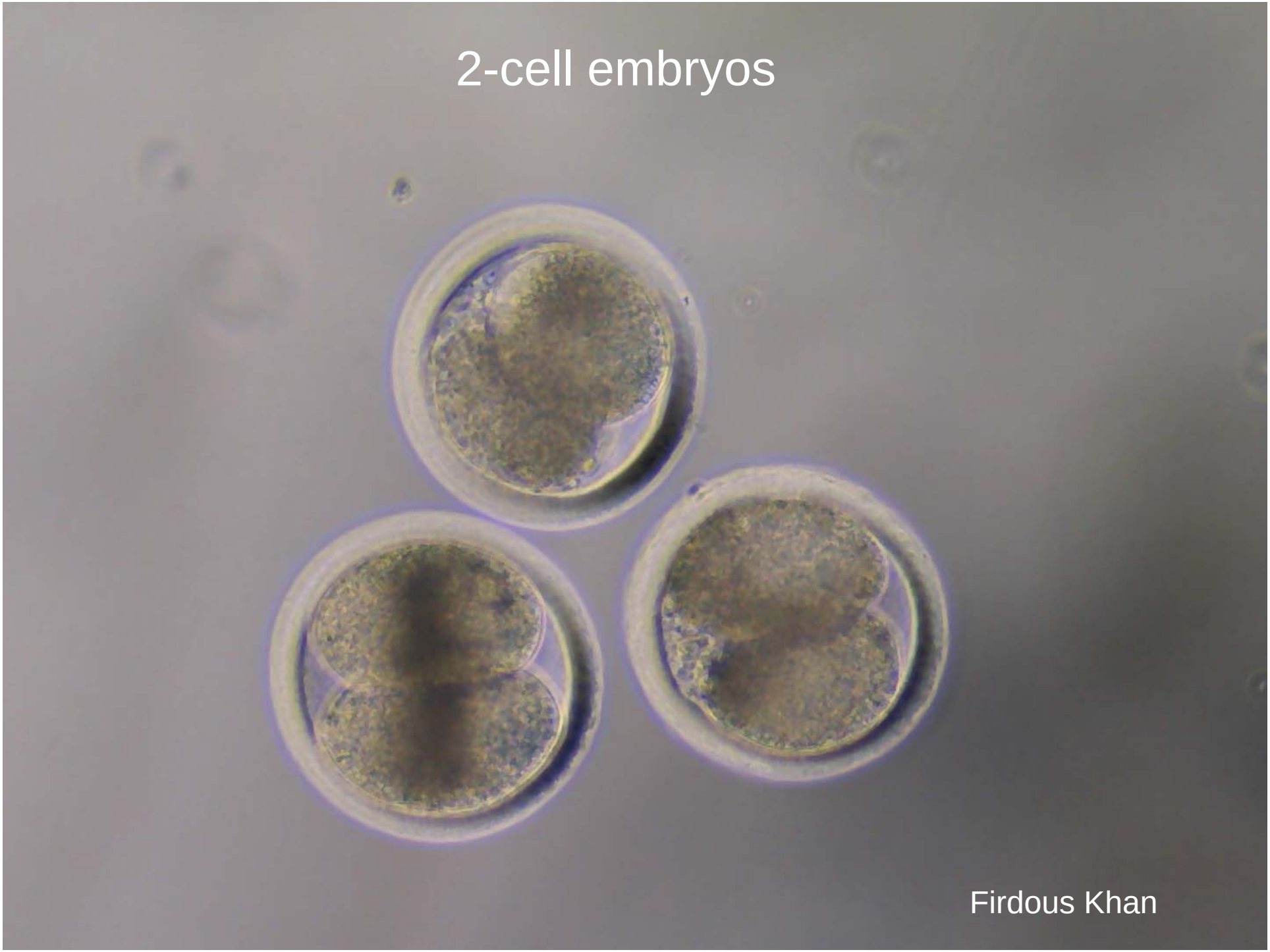
Expanded Blastocysts



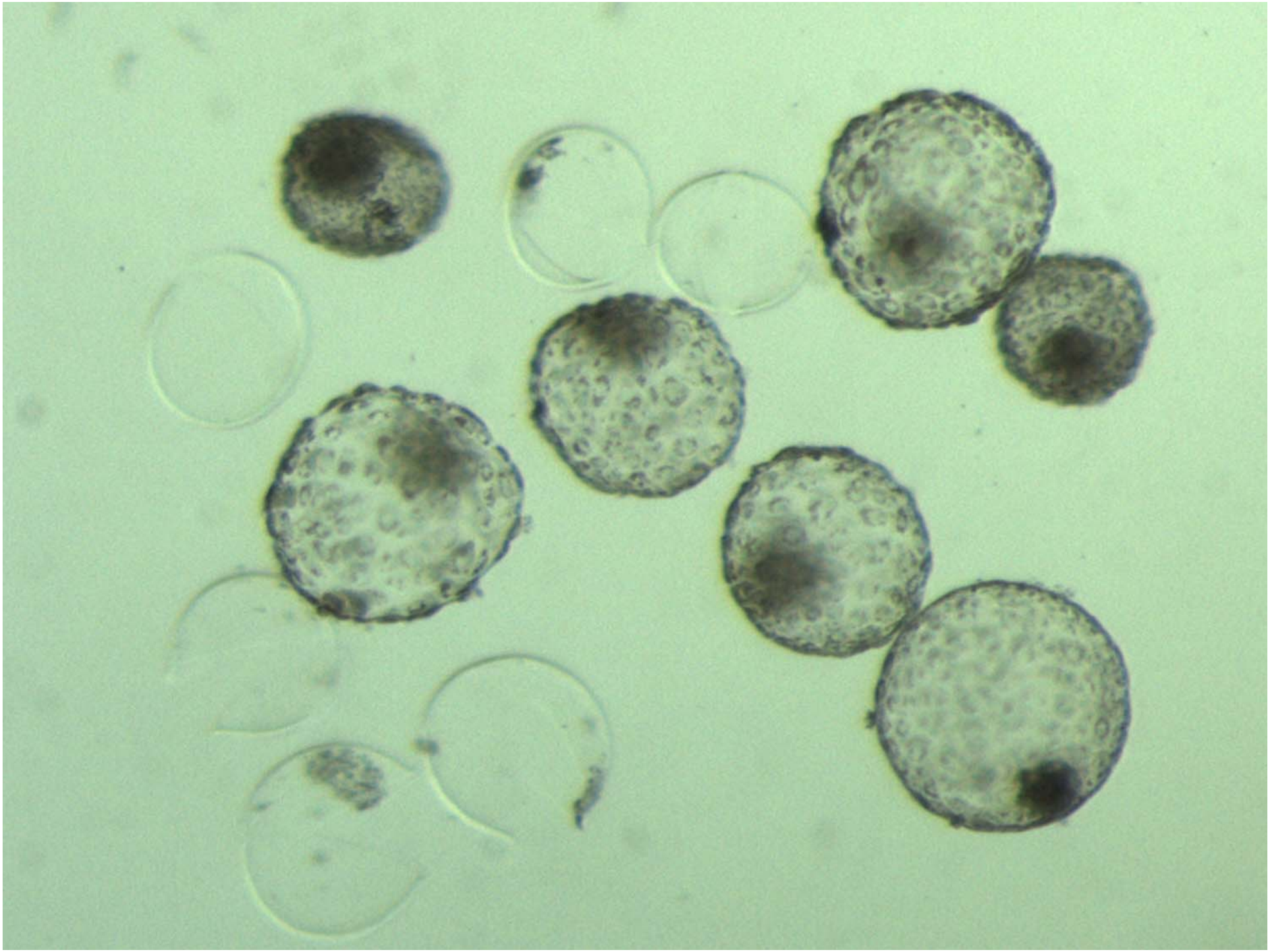
Aline Bonilla



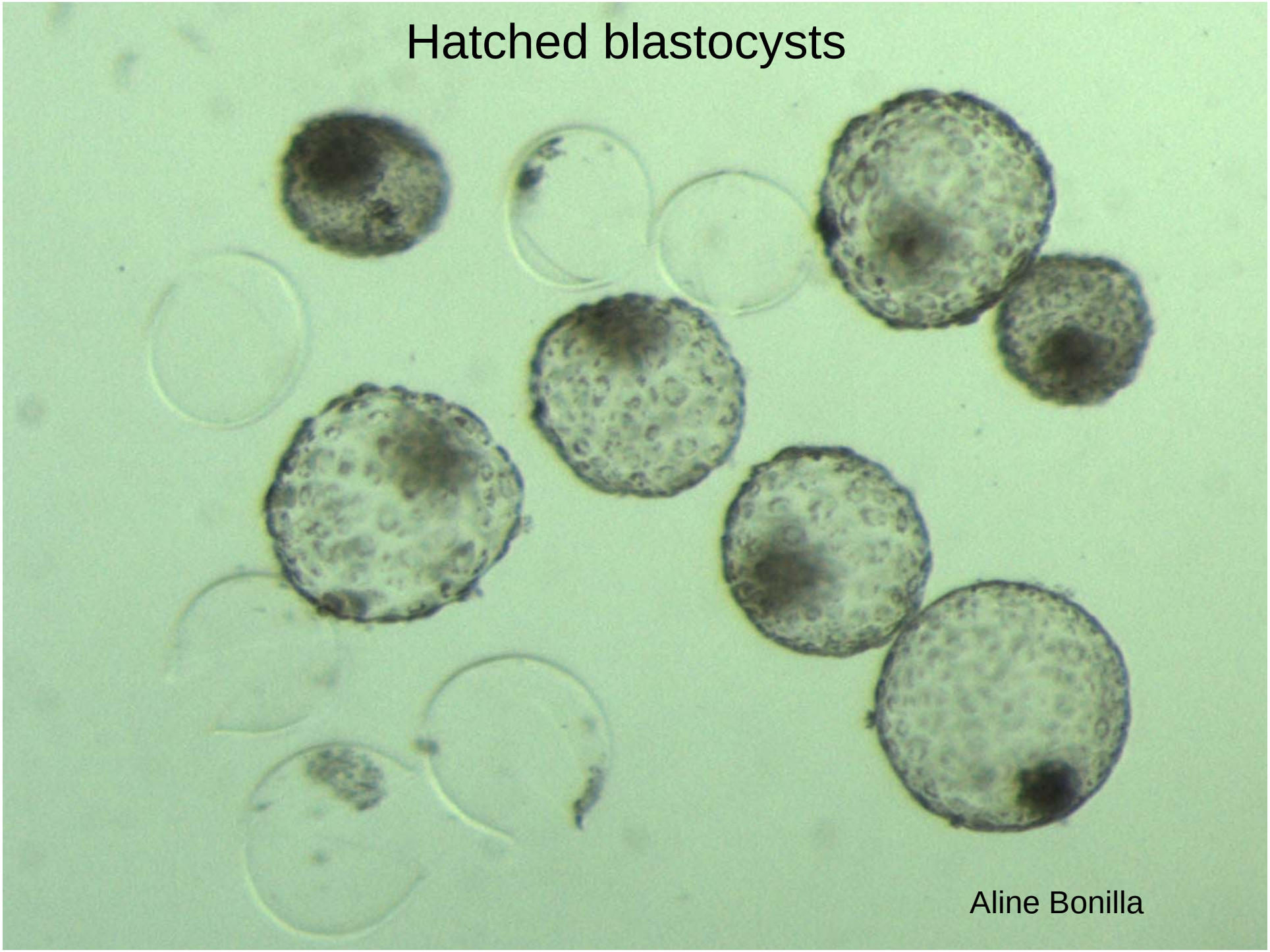
2-cell embryos



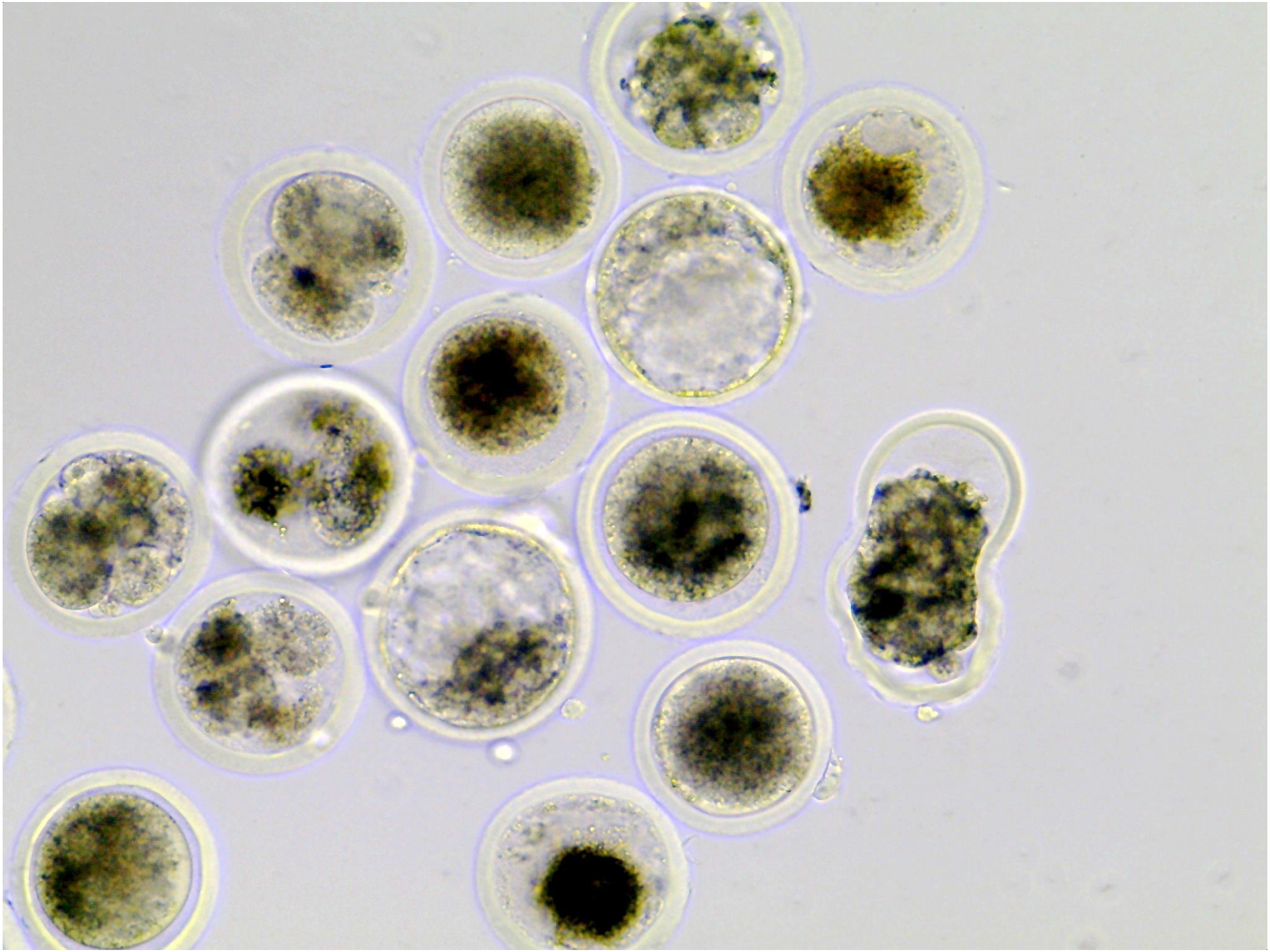
Firdous Khan

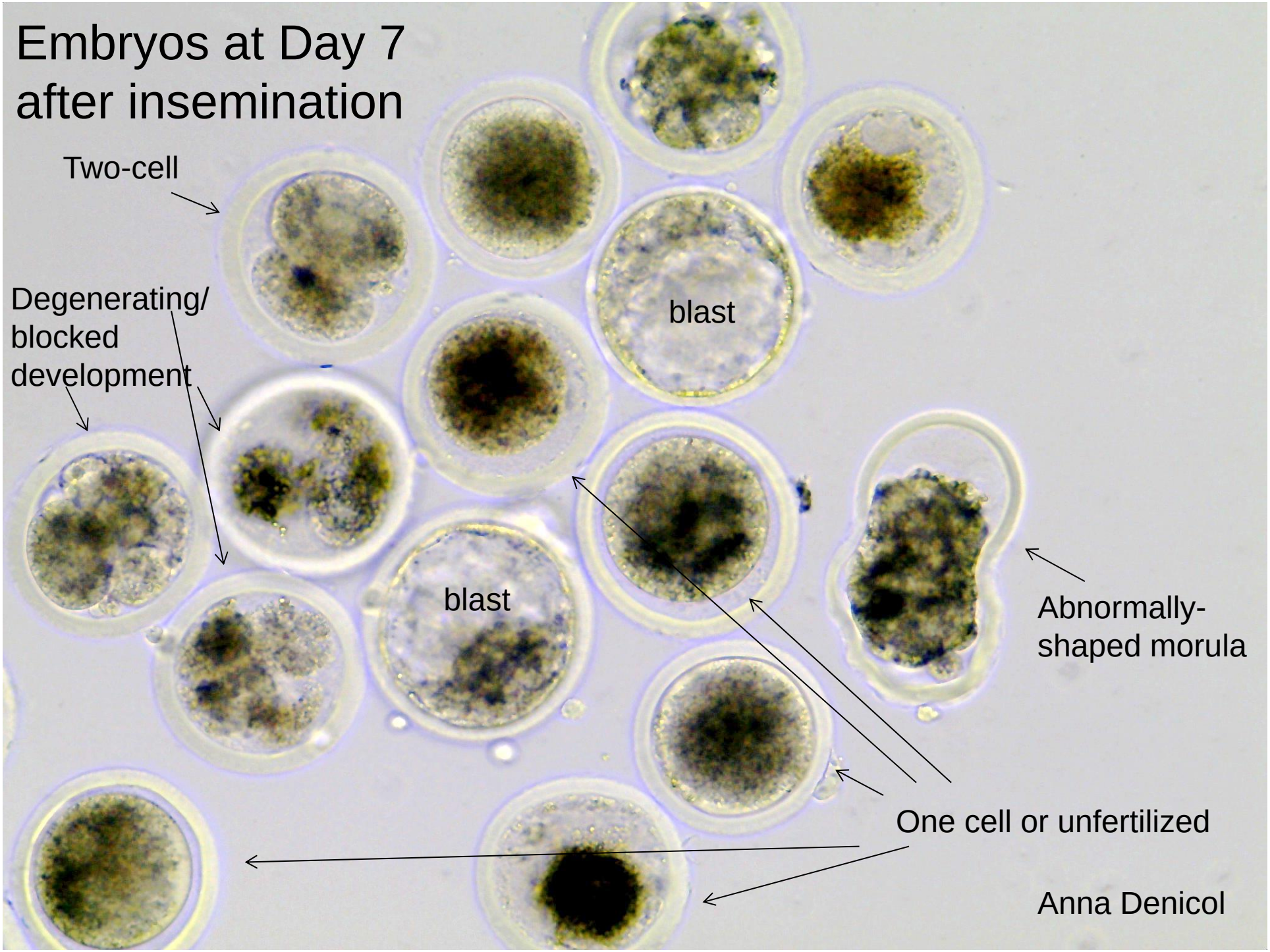


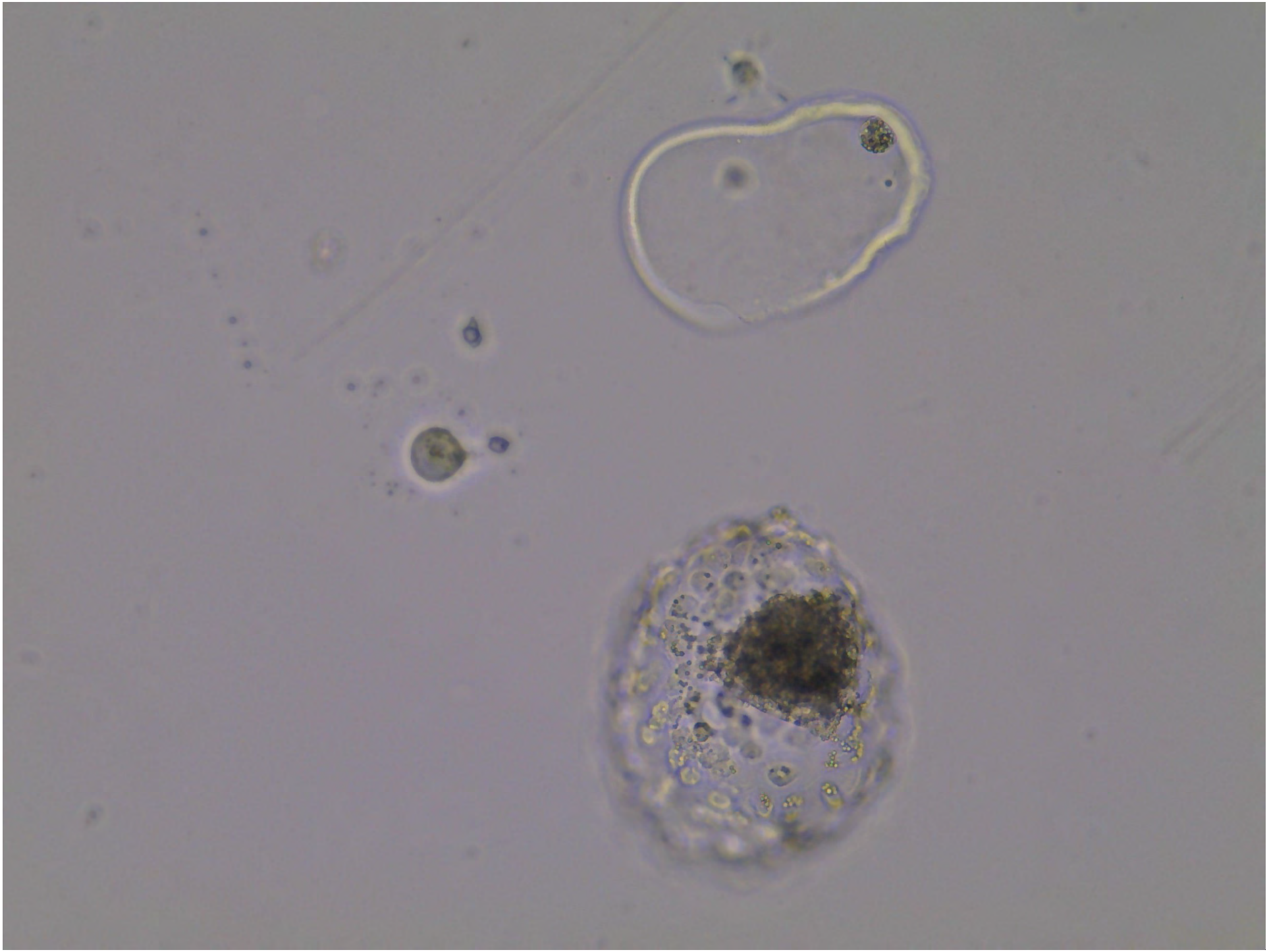
Hatched blastocysts



Aline Bonilla



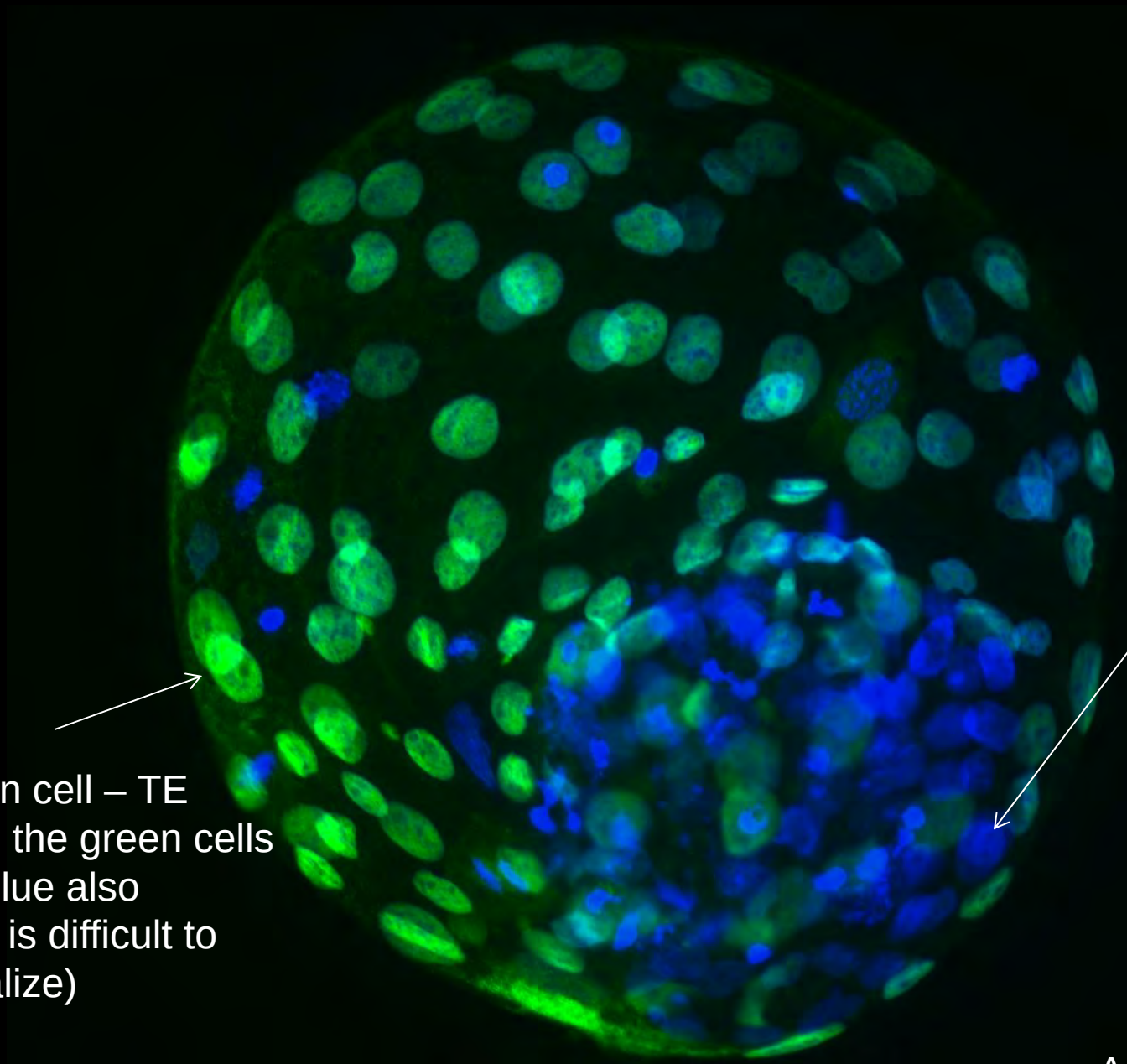

Embryos at Day 7 after insemination
Two-cell
Degenerating/ blocked development
blast
blast
Abnormally-shaped morula
One cell or unfertilized
Anna Denicol




Hatched blastocyst at Day 8 – this embryo was the abnormal morula in the Previous slide
Anna Denicol

And now, some embryos that have been labeled with specific markers…..

Differential immunostaining using FITC for TE (CDX2+) cells and Hoescht 33342 for all nuclei



Blue cell with no green – ICM

Green cell – TE
(note the green cells are blue also but it is difficult to visualize)

Anna Denicol

Contributors

P.J. Hansen (text)

Aline Bonilla
Amber Brad
Anna Denicol
Katherine Hendricks
Firdous Khan