



## WEILL MEDICAL COLLEGE POSITION DESCRIPTION

Position: **Post-doc Researcher / Bioinformatics**

Department: Medicine                      DIVISION: Hematology/Oncology

Reports to: Effie Apostolou, PhD      Contact: [efa2001@med.cornell.edu](mailto:efa2001@med.cornell.edu)

### **POSITION SUMMARY**

**The lab:** The Apostolou group studies the molecular mechanisms governing cell fate changes during somatic cell reprogramming and differentiation (1, 2, 3, 4). Specifically, we investigate the interplay among three-dimensional chromatin architecture, transcription factors and epigenetic regulators and their effect on gene expression and cell identity (5). We use high-throughput sequencing techniques such as 4C-Seq, HiC, ChIP-seq and RNA-seq, as well as biochemical, molecular and cell biology assays and novel mouse genetics tools. Among other questions, we ask how dynamic chromatin rearrangements are implicated in physiological or pathological cell fate alterations, such as cancer.

**The position:** The successful candidate will work closely with wet-lab researchers in the team and with collaborators within Weill Cornell Medical Center (WCMC) as well as Rockefeller University and Memorial Sloan Kettering Hospital. The goal is to apply bioinformatics approaches to interpret genome-wide biological data and to drive experimental discovery. The candidate will be co-mentored with Dr Olivier Elemento at WCMC's Institute of Computational Biomedicine (ICB). The ICB has a large group of talented and experienced computational biologists on whom the candidate can rely for intellectual input, support and extensive computational resources.

### **POSITION ACTIVITIES**

- 1) Bioinformatics analysis of RNA-Seq, ChIP-Seq, 4C-Seq, Hi-C data
- 2) Development of novel algorithms for normalization, analysis and illustration of next-generation sequencing data
- 3) Correlation/Integration of multiple datasets

## **MINIMUM REQUIREMENTS**

- 1) A PhD in Biology, Bioinformatics or Computer Science.
- 2) Strong background in bioinformatics with proven experience in analysis of next-generation sequencing data.
- 3) An ability to program in at least one widely used language (Perl, Python, Java, C++, etc.) and proficiency in statistical software packages such as R / Bioconductor
- 4) **Applicants should send a cover letter, their curriculum vitae and contact information for at least two referees to [efa2001@med.cornell.edu](mailto:efa2001@med.cornell.edu)**

## **HIGHLY DESIRED SKILLS AND ABILITIES**

Strong publication record.

A high degree of enthusiasm for science and passion for innovation.

Strong sense of responsibility and an ability to work independently.

Collaborative spirit and excellent communication skills.

## **References**

1. Stadtfeld M\*, **Apostolou E\***, Hidenori A, Atsushi F, Patricia F, Sridaran N, Tomohiro K, Toshi S and Hochedlinger K. Aberrant silencing of imprinted genes on chromosome 12qF1 in mouse induced pluripotent stem cells. *Nature* **2010**; 465 (7295):175-81
2. Stadtfeld, M\*, **Apostolou E\***, Ferrari F, Choi J, Walsh RM, Chen T, Oi S, Sang YK, Bestor T, Shioda T, Park PJ.& Hochedlinger K. Ascorbic acid prevents loss of Dlk1-Dio3 imprinting and facilitates generation of all-iPS cell mice from terminally differentiated B cells. *Nature Genetics* 2012 44(4):398-405
3. Polo JM, Anderssen E, Walsh RM, Schwarz BA, Nefzger CM, Lim SM, Borkent M, **Apostolou E**, Alaei S, Cloutier J, Bar-Nur O, Cheloufi S, Stadtfeld M, Figueroa ME, Robinton D, Natesan S, Melnick A, Zhu J, Ramaswamy S, Hochedlinger K. A molecular roadmap of reprogramming somatic cells into iPS cells. *Cell* **2012** 151(7):1617-32
4. **Apostolou E.** and Hochedlinger, K. Chromatin dynamics during somatic cell reprogramming. *Nature* **2013** 502(7472):462-71
5. **Apostolou, E.**, Ferrari, F.\*, Walsh, RM., Bar-Nur, O., Stadtfeld, M., Cheloufi, S., Stuart, HT., Polo, JM., Ohsumi, TK., Borowsky, ML., Kharchenko, PV., Park, PJ., Hochedlinger, K. Genome-wide chromatin interactions of the Nanog locus in pluripotency, differentiation and reprogramming. *Cell Stem Cell* **2013** 12(6):699 - 712

## **Relevant Websites:**

Apostolou lab: TBA

Institute of Computational Biomedicine at WCMC: <http://icb.med.cornell.edu/>

Olivier Elemento's lab: <http://physiology.med.cornell.edu/faculty/elemento/lab/>