



— Computational deconvolution for patient stratification in the context of non-small cell lung cancer

Puzzle Freak

Computational methods can help to unravel the complexity of the tumor microenvironment of individual patients. We ask for your help to assess such methods to enhance our understanding of cancer heterogeneity and to improve patient classification.

Apply until **Nov 30, 2020** / Pitch on **Dec 11, 2020**

Question to be solved

Can patients be stratified by their immunological tumor environment and does this additional information improve classification models?

General Background

It has been shown that the levels of tumor infiltrating immune cells are associated with tumor growth, disease progression and patient outcome. Common methods for studying cell heterogeneity such as flow cytometry are limited by cell type marker selection and sample processing steps. Recent computational methods enable the prediction of cell type frequencies in tumor samples solely from gene expression data. An ideal method for feature engineering in the context of patient stratification.

Data Types & Technologies

- Transcriptomic data from publicly available data sources such as the gene expression omnibus (GEO)
- R packages: Caret, Cellmix

Supporting Material or Links

- Shen-Orr, S. & Gaujoux, R. Computational deconvolution: extracting cell type-specific information from heterogeneous samples. *Curr Opin Immunol* 25, 571–578 (2013).
- Newman, A. et al. Robust enumeration of cell subsets from tissue expression profiles. *Nat Methods* 12, nmeth.3337 (2015).

Needed Skills

- Self-starter and organisational talent
- Interest in cancer immunotherapy is a plus
- Strong statistical background
- Good knowledge in R or other statistical programming language

Mentor

Dr. Jan Rieckmann

Team Lead Data Science

Form of Cooperation

Preferred scale: 3 months full-time (flexible models are also possible)

Possible format: Internship

How to present your Idea

Show us how you would approach the problem. You can prepare your idea proposal in 3-5 slides, any other idea/format to share your proposal with us is also welcome. We do not expect a bullet-proof solution to the problem.
