BP10 - Uncovering biological signals involved in bladder cancers with Independent Component Analysis

Anne Biton, Andrei Zinovyev, Yves Allory, Emmanuel Barillot & François Radvanyi

- Stages and Evolution of Bladder Cancer
  4th most common cancer in men
  9th most common cancer in women

- Two pathways of progression:
  - FGFR3 ≈75%
  - FGFR3 ≈20%
  - FGFR3 ≈15%

- Except the FGFR3 mutation the underlying molecular process have not been identified yet.
- Goal: Confirm and extend the list of biological processes known to be involved in the specific context of bladder cancer.
• Application of Independent Component Analysis (ICA) on a large cohort of urothelial tumors.

• Decomposition of the expression matrix into a fixed number of statistically independent signals: \( X = AS \)

  - Map components to known pathways and genomic regions using gene projections (S)

  - Check reproducibility of the components on 3 other datasets

  - Link components to clinical/survival data using components activity on the samples (A)