Recherche d’ARNs de fusion dans les données de RNA-seq de patients atteints de leucémies myéloïdes. Applications et perspectives pour le diagnostic, pronostic et suivi des patients
Detection of fusion RNA from RNA-seq in myeloid leukemia

**Fusion RNA**: abnormal messenger produced in cancer cells resulting from chromosome translocation or «fused» RNAs

A tool for diagnosis, prognosis, disease follow-up
Detection of fusion RNA from RNA-seq in myeloid leukemia

**Fusion RNA**: abnormal messenger produced in cancer cells resulting from chromosome translocation or « fused » RNAs

« A methodological challenge »
The problem

1/ To find rare specific sequences in a huge read collection of RNA-seq Read (10 reads /30, $10^6$)

2/ To distinguish all biological events

3/ To distinguish biological events from technical artefacts

This fusion: 10 reads out of 30 millions
The problem

Differences between bioinformatics tools

State-of-the-art fusion-finder algorithms sensitivity and specificity.

BioMed research international, 2013
CRAC, an open source software, provides a standard File format (SAM mapping file)
A global view of all the biological causes in RNA-seq
CracTools: modules to build post-treatment workflow for integrative biology »
Detecting fusion RNA (or chimeric RNA) based on CRAC software
4 Fusion RNA classes

Class 1
- Translocation
- Trans-épissage
- Artefact RT

Class 2
- Trans-épissage
- Read-throught
- Déletion chromosomique
4 Fusion RNA classes

Class 3

Class 4
Collaborative data acquisition (45 AML-RNA-seq)

Dr Wang- University of Nebraska medical center

International network of cancer genome projects

The International Cancer Genome Consortium*
Perspectives

- **Global genomic studies**
  - Rank/Score ..... 
  - Fonctionnal Gene ontology (gene networks), 
  - Comparison with normal tissues (classe 2)

- **Clinical studies**
  - Comparison with survival, response to treatment, comparison with gene expression profiles of known genes

- **Transcriptome and peptidome profiling**
  - for Biomarkers design and large scale studies

- **SATTï Project**
Notre groupe

J Adoux
A Boureux
M Galloni
N Philippe
F Rufflé

CHU_Nîmes/IGR

E Jourdan
John Devos
E Solary

MAB

E Rivals
A Mancheron
L Brehelin

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M Salson

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D Piquemal
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