Cancer Immunotherapy: the LMCT experience

Kris Thielemans

Karine Breckpot
The Research Program

stimulating antitumor immune responses

→ "tumor antigen-dependent"
  T helper 1 cells (T\textsubscript{H}1)
cytotoxic T cells (CTLs)

vaccine development:

✓ mRNA
  → Modified mRNA
  → Encapsulation of mRNA
  → Adjuvant

✓ lentiviral vectors
  → Targeting of dendritic cell subsets

vaccination routes: intranodal, intratumoral, intravenous

clinical trials: melanoma, myeloma
  → Translation of the preclinical studies

→ "tumor antigen-independent"
  induction of immunogenic cell death:
oncolytic viruses, ultrasound, epidrugs

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genetic and epigenetic alterations

→ epigenetic alterations:
  - modulation of antigen expression
  - induction of immunogenic cell death
    → New agents and their combination with cancer vaccination

→ genetic instability:
  → Neo-epitopes for cancer vaccination

→ immune checkpoints:
  - supporting activated T cells
    → New agents blocking PD-1/PD-L1, LAG3/MHC-II

→ myeloid regulatory cells:
  - macrophages
  - myeloid-derived suppressor cells
    → Drug screening
    → New agents targeting mREGs

counteracting immunosuppression
The team and its context

- Karine Breckpot (100% ZAP)
- Kris Thielemans (100% ZAP)
- Karin Vanderkerken (100% ZAP)

Research team:
- Post-docs: 3
- PhDs: 8
- Scientific collaborators: 1
- Lab technicians: 5
- Secretary: 1

Dendritic cell bank, Clean room, GMP mRNA production facility

Core facilities: Flow cytometry, Virus production facility, Nanostring technology, BLIP
The team and its context
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The LMCT team

Gender ➔ Female to male ratio ±2

Nationalities: 10

➔ Countries: Belgium, China, Cuba, Germany, Italy, Mexico, Nigeria, Poland, Spain, the Netherlands
The LMCT output: last 5 years

**LMCT-members GRADUATED in the last 5 years**

- 10 continued as POST-DOCTORAL FELLOW

**88 SCIENTIFIC PAPERS**

**PROFESSIONAL PRESENTATIONS**

- > 150 (inter)national seminars, conferences and symposia

- > 20 news features on topics such as treatment of melanoma, dendritic cell vaccines, mRNA vaccines, lentiviral vectors and nanobodies for tumor targeting
The LMCT output

> 15 patents

The spin-off eTheRNA Immuno-therapies NV was founded in 2013
(http://www.etherna.be)

5 clinical studies for the treatment of melanoma, myeloma and hepato-cellular carcinoma patients