

In vitro co-cultures of human immune cells and (lung) tumor cells

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Organisation

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Department Health

Country Belgium

Geographical Area Flemish Region

SCOPE OF THE METHOD

The Method relates to	Human health
The Method is situated in	Basic Research
Type of method	In vitro - Ex vivo
Species from which cells/tissues/organs are derived	Human
Type of cells/tissues/organs	Human
Specify the type of cells/tissues/organs	lung cancer (A549, NCI-H1975), immune cells (subtypes of PBMCs and neutrophils)
Used species	Human
Targeted organ system or type of research	Lung

DESCRIPTION

Method keywords

A549

PBMC isolation

magnetic separation

treatment of cocultures

Scientific area keywords

immunotherapy
Lung cancer
PBMC
cancer treatment

Method description

By using *in vitro* co-cultures of immune cells and lung tumor cells, we can study and evaluate the immune-activating and/or anti anti-tumor properties of certain treatments. Tumor cell proliferation can be studied with live-cell imaging instruments (IncuCyte, EVOS, ...) and the occurrence of immune activation can be evaluated by measuring immune mediators (IL-2, IFN γ , TNF α , ...) in the supernatant of the co-cultures with ELISA, MSD or mass spectrometry.

On the first day, tumor cells can be seeded in well plates and can be grown for 24h. Just before addition of the different immune cell types, a cell image of the whole well can be generated. Different immune cell types can be added to the wells and selected wells can be stimulated with a treatment of choice. After 72h of culturing, cell images can be generated and compared to each other to evaluate tumor cell proliferation. Also, the supernatant of each condition can be used to measure immune mediators of interest to evaluate immune activation for each condition separately.

Lab equipment

Incubator;
Laminar flow;
Well plates;
Pipets;
Live-cell imaging microscope;
ELISA plates/MSD instrument/mass spectrometer.

Method status

Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

Easy-to-use;
High-throughput;
Rapid results;
High reproducibility.

Challenges

Heterogeneity of the tumor microenvironment is not taken into account.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

Eline Berghmans, Julie Jacobs, Christophe Deben, Christophe Hermans, Glenn Broeckx, Evelien Smits, Evelyne Maes, Jo Raskin, Patrick Pauwels and Geert Baggerman. Mass Spectrometry Imaging Reveals Neutrophil Defensins as Additional Biomarkers for Anti-PD-(L)1 Immunotherapy Response in NSCLC Patients (2020). Cancers (12; 863)
doi: 10.3390/cancers12040863

Links

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7225984/>

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