FOXP3 EXPRESSION IN HUMAN CANCER CELLS

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CD25: a chain of the IL-2 receptor

FoxP3: transcription factor that inhibits expression of cytokine genes

LAG-3 (CD223): homologous to CD4; binds to HLA





Foxp3: The gene

- Transcription factor that is characteristic of natural T regulatory cells (nTregs)
- Activated CD4+CD25- and CD8+CD25- T cells can acquire a regulatory phenotype by expressing Foxp3, which results in reducing their functional reactivity
- T cells derived from Foxp3 Tg mice (over-expression of Foxp3) cannot be easily stimulated through TcR cross-linking
- T cells derived from Foxp3 Tg mice (mutation of Foxp3, scurfy mice) are in a state of constant activation



Foxp3: Function in Tregs

Transcriptional activation of cell surface molecules such as CD25, GITR, CTLA-4 και CD103



Transcriptional regression of gene expression (IL-2, IL-4 and IFN- γ)



Foxp3: The gene/protein

- Expression of Foxp3 only on CD4+ T cells
- Low or no transcripts expressed by other lymphocytes (B, CD8 etc)
- Low or no transcripts expressed by other tissue cells

Expression of Foxp3 in Tregs is a result of gene demethylation

Foxp3 participates in **immune escape**



Hypothesis

Foxp3 promoter demethylation in cancer cells can result in the expression of Foxp3 protein and/or other factors with a suppressive function

Aim

To search for Foxp3 transcripts and protein in cancer cells of various origins





Materials

Cancer cell lines	Type of cancer
CALU-1, CALU-6, GILI, ONET, SK-LU-1, NCI-H441, NCI- H460, NCI-H596, NCI-H661, NCI-H520, PGEGE, PKAKI and PINTZ	Lung cancer
HCA 2.6, HCA 3.2	Colon cancer
MCF7, T47D, HBL-100p40, BT20, MDAMB231	Breast cancer
GERL, DAJU 2.7, MEL272,	Melanoma
K562	Erythroid leukemia
JURKAT	Acute T cell leukemia





Methods



mRNA

✓ Conventional PCR (b-actin)

✓ Real Time PCR (β2m)

Protein

✓ Immunohistochemistry (clone 236A/E7, Bioscience)

✓ Flow cytometry (clone PCH101, Bioscience)











Results: Foxp3 protein







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Concluding Remarks

- **Foxp3 is expressed at the transcript and protein level in cancer cells**
- Although Foxp3 expression is lesser than Tregs, its protein levels are significantly high enough
- Expression of Foxp3 does not seem to alter after treatment with epigenetic drugs
- Expression of Foxp3 levels does not seem to correlate with TGF-b and IL10 expression levels
- What is the role of Foxp3 in cancer cells?





Thank you for your attention

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Results: Foxp3 in tissues



