



DISCOVERING AND
DEVELOPING NEW IMMUNE
ACTIVATING MECHANISMS
AND ANTIBODIES TO IMPROVE
CANCER SURVIVAL

Annual General Meeting

24 April 2018

Björn Frenhéus, Acting CEO & CSO



IMMUNOTHERAPY HAS TRANSFORMED CANCER TREATMENT, BUT NEW DRUGS AND MECHANISMS ARE NEEDED

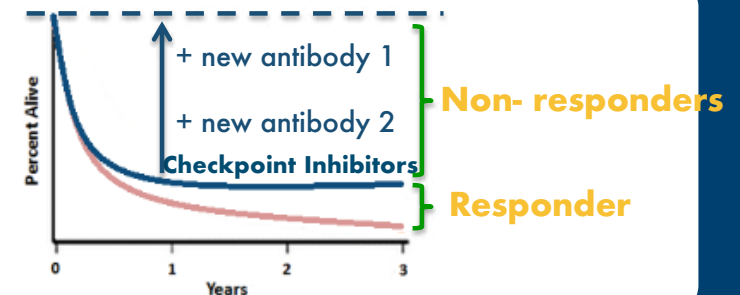
THE CONCEPT WORKS:

New drugs direct the immune system to combat tumours



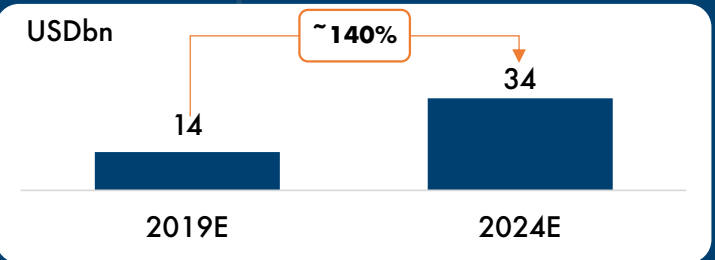
ONLY A SUBSET OF PATIENTS RESPOND TO CURRENT DRUGS:

New mechanisms and antibodies needed to improve outcomes



A RAPIDLY GROWING MARKET:

Expected to reach sales of USD 34bn in 2024

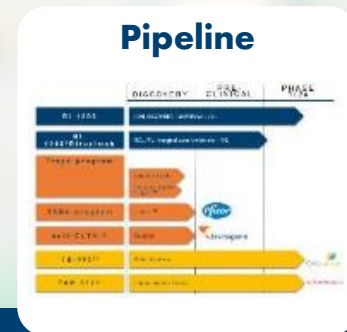


Source: GlobalData 2016 (Immuno-Oncology Strategic Insight: Multi-Indication and Market Size Analysis)

A SWEDISH BIOTECH AT THE FRONT LINE OF IMMUNO-ONCOLOGY



Two clinical
stage programs



A focused cutting-
edge discovery
pipeline



Strategic
collaboration with
the largest pharma
company in the
world



Commercial
production and
drug
development
agreements

VALUE CREATION THROUGH CUTTING-EDGE SCIENCE

UNIQUE TECHNOLOGY PLATFORM

- Patient-centric, holistic, approach for combined target and drug discovery
- Patient materials throughout discovery process
- Predictive state-of-the-art animal models (in-house)



SCIENTIFIC EXCELLENCE

- Strong in house R&D team, international collaborators & scientific advisory board
- Cooperation with leading international scientific groups
- BioInvent discovered mechanisms and antibodies published in world leading scientific journals

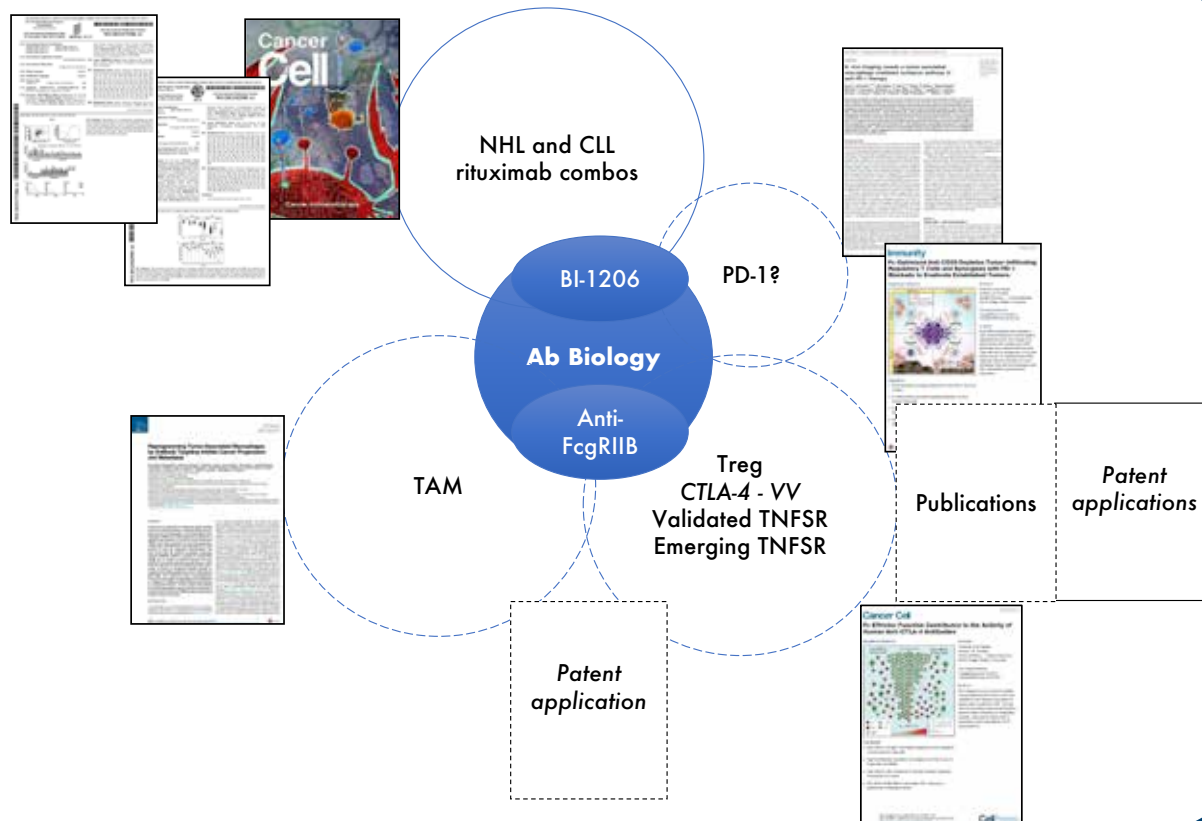


COMMERCIAL FOCUS

- Continuous commercial benchmarking of programs
- Proven track record to secure attractive commercial agreements
- Cash flow from R&D collaborations and production

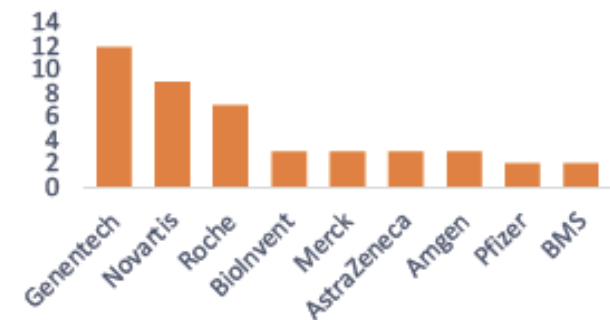


BUILDING VALUE THROUGH A PIPELINE FOCUSED ON SCIENCE, DISCOVERY AND DIFFERENTIATED ANTIBODY-BASED PRODUCTS

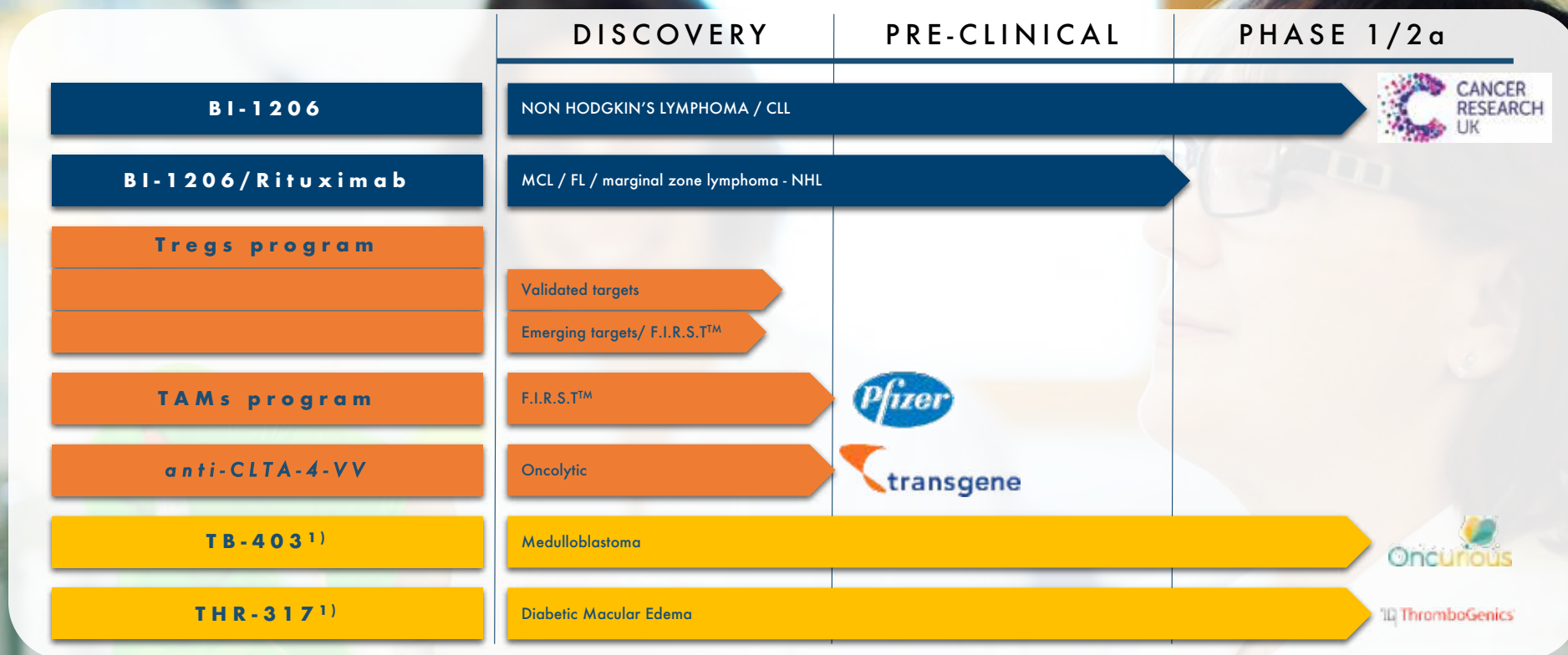


"The company with the strongest immunologists will win the race"
- Senior Executive at Leading Biopharmaceutical company

No of original Cancer Cell Publications (last 5 yrs)



BIOINVENT PIPELINE








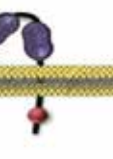
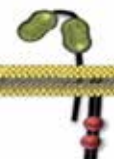
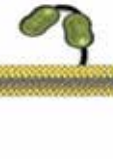
BI-1206 / anti-FcγRIIB

**Targeting the sole inhibitory FcγR checkpoint to boost
antibody-mediated cancer immunotherapy**

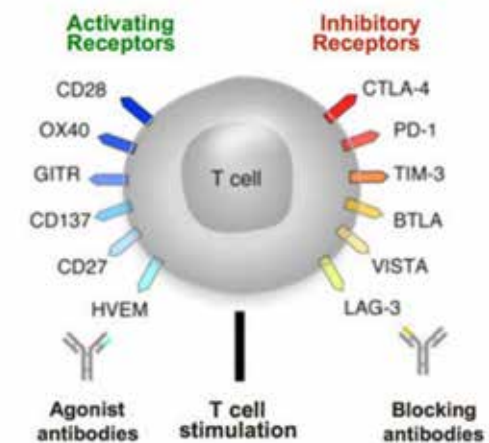
A SINGLE INHIBITORY ANTIBODY CHECKPOINT TO UNLOCK INNATE AND ADAPTIVE ANTI-CANCER IMMUNITY

- Only one known inhibitory checkpoint for antibodies = Fc gamma receptor IIb
- Multiple inhibitory T cell checkpoints (need to target multiple to prevent resistance development)

ANTIBODY CHECKPOINTS

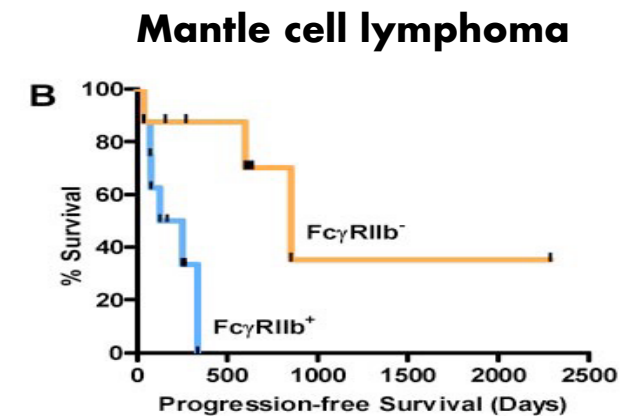
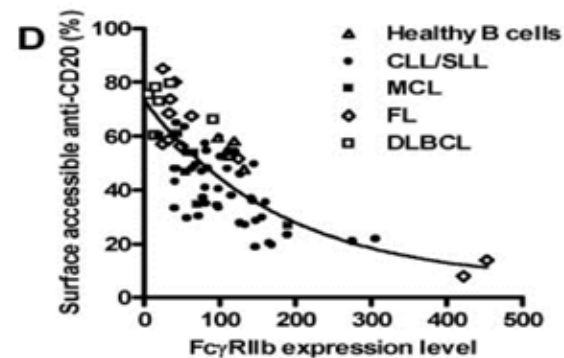
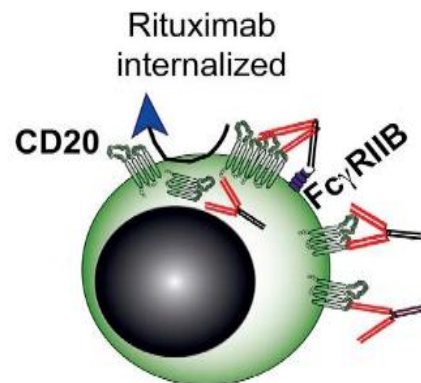
	Activating	Activating	Inhibitory	Activating	Activating	Activating
	FcγRI	FcγRIIa	FcγRIIb	FcγRIIc	FcγRIIIa	FcγRIIIb
						
Gene	<i>FCGR1A</i>	<i>FCGR2A</i>	<i>FCGR2B</i>	<i>FCGR2C</i>	<i>FCGR3A</i>	<i>FCGR3B</i>
Locus	1q21		1q23		1q23	
MW (kDa)	72		40		50–80	
Expression	Monocytes, MΦs, PMNs (induced)	Myeloid cells, DCs, platelets	B cells, myeloid cells, DCs	NK cells	MΦs, NK cells, monocytes (subset)	PMNs

T CELL CHECKPOINTS



Source: Nature Immunology (Volume 15, Number 8, August 2014)

FCGRIIB ON TUMOUR B-CELLS REDUCES RITUXIMAB EFFICACY THROUGH INTERNALIZATION



Source: Roghanian, Cancer Cell, 2015; Lim, Blood, 2011; Lee, Br J Hematol, 2014

OVERCOMING RITUXIMAB-RESISTANCE

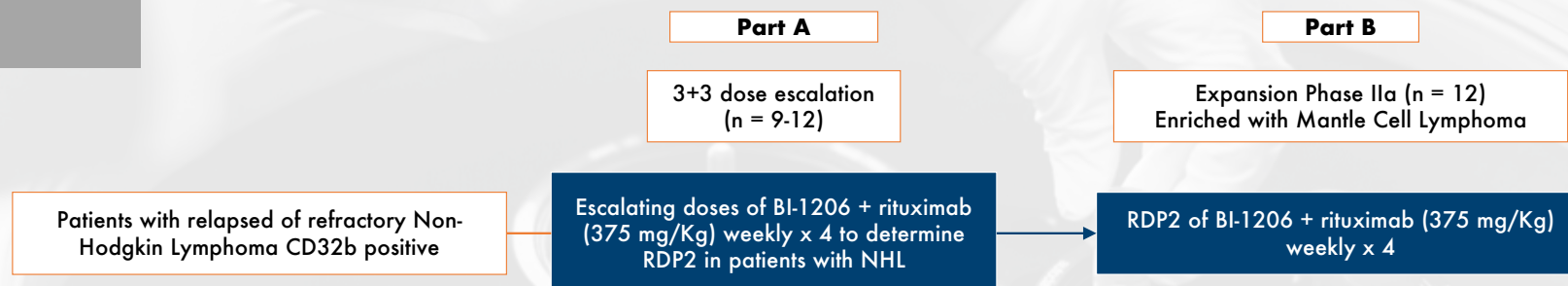
BI-1206

- Problems with **resistance development against current standard of care** Mabthera (rituximab) and similar antibodies against CD20
- Adding BI-1206 to rituximab has the potential to solve the **resistance problem** and to **improve efficacy**
- BI-1206 **Phase I/II-study** commenced at the end of 2016
- Initial dose & tolerability data during **H1 2018**
- New, parallel study commencing H1-18 will combine BI-1206 and rituximab in patients **with B-cell NHL**
- **Patent protection** for the use of antibodies for CD32b, such as e.g. BI-1206 **in combination with rituximab**, for treatment of cancer or inflammatory diseases in some patient groups **has been granted in Europe, Japan and Australia and is pending in the US** and several other major markets

BI-1206: EXPANDING THERAPEUTIC POTENTIAL - PHASE I/IIA STUDY

- A multi-centre, open label, Phase I/IIa study in relapsed or refractory NHL patients enriched with Mantle Cell Lymphoma – US & EU
- High proportion of patients expressing CD32b in enriched population
- High unmet medical need – despite the availability of targeted therapies

Design



Objectives

- Safety & tolerability of BI-1206 in combination with rituximab
- Ph2 dose based recommendation (RDP2)
- Efficacy signal of the combination
- Biomarkers exploration (b-cell depletion, phosphorylation of FCRGIIB)

Start: H1, 2018
Last patient In: End 2019

SEVERAL PRECLINICAL PROGRAMS AT THE FOREFRONT OF IMMUNO-ONCOLOGY – TARGETING CANCER-ASSOCIATED REGULATORY T CELLS

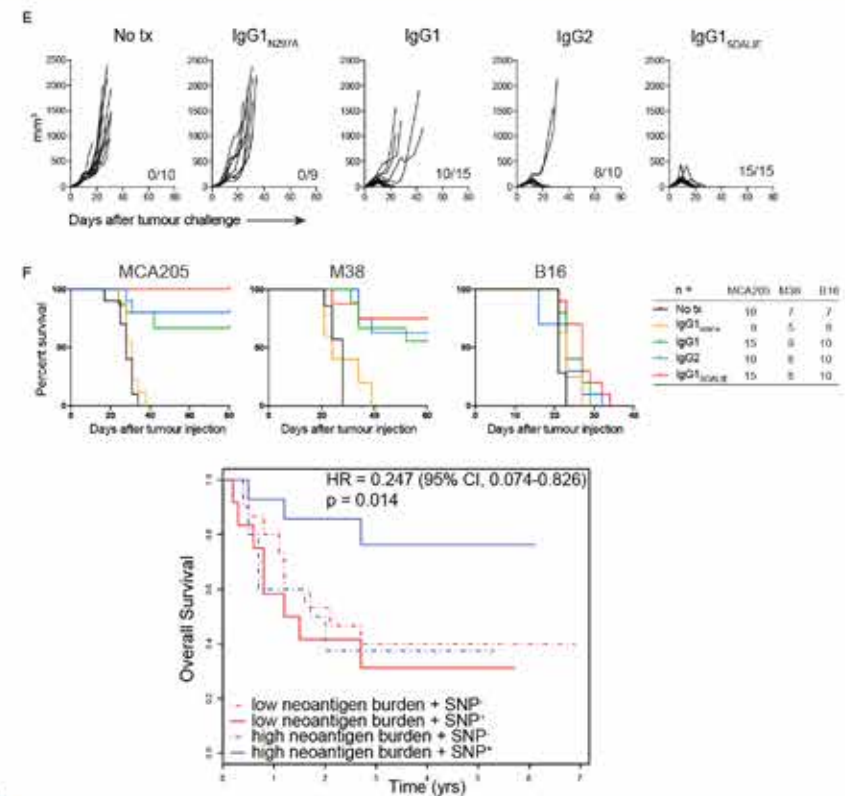
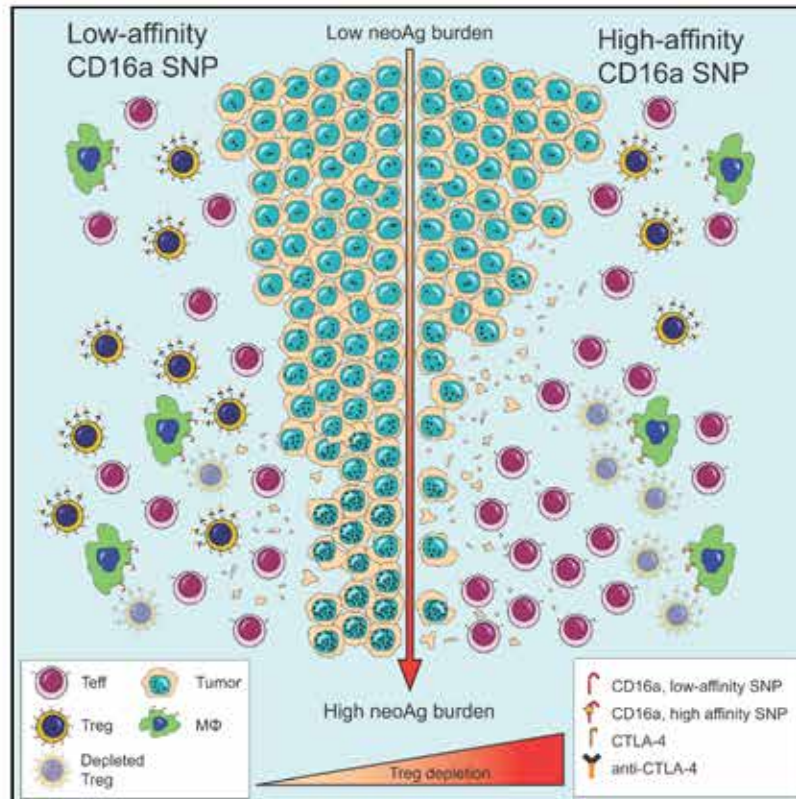
Validated

Emerging

**Novel
(F.I.R.S.T™)**

- Attractive drug targets
- Promising initial data
- Potentially strong patents
- Licensing opportunities and possible strategic cooperation


“TROJAN HORSE” α ANTI-CTLA-4 ENCODING ONCOLYTIC VIRUS – Improving on validated Mechanism-of-action of ipilimumab



Vargas et al, Cancer Cell, 2018


BioInvent ON THE RADAR

9,445 views




94 people from Pfizer viewed your post

AstraZeneca	59
Novo Nordisk	51
Bristol-Myers Squibb	47
Genentech	45
The Janssen Pharmaceutical Companies of Johnson & Johnson	42
Lund University	33
Roche	30
Boehringer Ingelheim	30



860 people who have the title Laboratory Scientist viewed your post

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Physician	181
University Professor / Lecturer	171
Project Manager	163
Business / Corporate Strategist	119



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Greater Philadelphia Area	119
Greater San Diego Area	112



Bjorn Frendeus
Acting CEO & CSO på Bioinvent International AB
1mo · Edited

Check out our latest piece in Cancer Cell on Treg depleting, FcγR-dependent mechanism-of-action of clinically validated anti-CTLA-4 antibody ipilimumab. @
<https://lnkd.in/gZHYbHe>. ...see more

Cancer Cell
Fc Effector Function Contributes to the Activity of Human Anti-CTLA-4 Antibodies

Graphical Abstract

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In Brief
Arce Vargas et al. use a mouse model expressing human FcγRs to show that antibodies with isotypes equivalent to ipilimumab increase the CD8⁺ to Treg ratio by depleting intra-tumoral Tregs to promote tumor rejection. In melanoma patients, response to ipilimumab is associated with a high affinity FcγR polymorphism.

Highlights

- Anti-CTLA-4 of IgG1 and IgG2 isotypes promote depletion of intra-tumoral Treg cells
- IgG2 antibodies mediate in vivo depletion of intra-tumoral Treg cells via CD32a
- Anti-CTLA-4 with enhanced Fc effector function improves therapeutic outcomes
- The CD15-V158F SNP is associated with response to ipilimumab in inflamed tumors

“TROJAN HORSE” ANTI-CTLA-4 ANTIBODY ENCODING ONCOLYTIC VIRUS FOR THERAPY OF SOLID CANCER (TRANSGENE COLLABORATION)

- BioInvent and Transgene to co-develop next generation oncolytic virus encoding anti-CTLA-4 antibody for treatment of multiple solid cancers
- Preclinical data demonstrate power of “Trojan Horse” concept
- Improved efficacy of checkpoint-antibody-encoding virus compared to exogenously added antibody and virus combination
- Expected improved tolerability owing to lower systemic antibody exposure in peripheral non-tumor compartments
- Full length human recombinant anti-CTLA-4 antibodies have been generated and preclinically characterized by BioInvent



TAM PROGRAM

- Pfizer invests in BioInvent and signs cancer immunotherapy research collaboration and license agreement



- Development of anti-TAM antibodies and targets for therapy of cancer
- 10 MUSD early cash, including 6 MUSD in new BioInvent shares
- Potential milestone payments in excess of 0,5 billion USD*
- Up to double digit royalty
- Endorsement of BioInvent's immunooncology expertise

STATUS

- Project-organisation established
- Detailed work plan agreed and executed upon
- Weekly BioInvent / Pfizer working group meetings
- On track to develop new antibodies against Tumour Associated Myeloid Cells

TACK!