

dCODE[™] Dextramer[®]-Unravel Specificity of T-cell immunity

Sara Bursomanno, PhD Product Manager 10X Genomics User Group Meeting | Institut des Maladies Metaboliques et Cardiovasculaires, Toulouse.

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Immudex, preferred partner for T-cell immunomonitoring

- Location: Copenhagen (Denmark), Virginia and California (US)
- Reagents and diagnostic kits based on proprietary Dextramer[®] technology
 - Immunotherapy
 - Transplantation
 - Cellular therapy
 - Basic research in cellular immunity





Disease-specific immune monitoring





Dextramer based monitoring of antigen-specific T-cells





- Dextramer is a multimer reagent with increased sensitivity
- Detection of low-affinity T-cell receptors
- In situ visualization of antigen-specific T-cells



Complexity of the immune repertoire



- Adaptive immune response is highly specialized.
- Vast array of T cell receptors (10⁷ different TCRs).
- Each TCR can bind 10⁶ different peptide sequences.

dCODE[™] Dextramer® - DNA barcoded MHC multimer



- Unique DNA barcode specifying the MHCpeptide complex on the Dextramer[®]
- PE-label for visualization in flow cytometry
- The MHC-peptide specificity can be identified by PCR and sequencing of the DNA barcode
- Massive multiplexing
- Combined with NGS techniques

For Research Use Only. Not for use in diagnostic or therapeutic procedures



Applying NGS to the immune repertoire



Single Cell Analysis of Antigen-specific T-cells



dCODE Dextramer (10x compatible)

- Compatible with 10x Chromium system
- PE fluorochrome for cell sorting
- Antigen specificity + TCR clonotype + gene expression
- New understanding of T-cell immunology in cancer, allergy, infectious and autoimmune diseases.

Antigen specificity, TCR clonotypes and gene expression in one workflow



Analysis of HPBMC from CMV+ and CMV- donors using dCODE Dextramer panel



- Pool of 12 dCODE Dextramer reagents (CMV, EBV, Flu, negative control)
- 2 donors: CMV seropositive and CMV seronegative

Application notes available at 10xgenomics.com

Single cell immunophenotyping of antigen-specific CD4+ T cells using MHC II dCODE Dextramer®



MHC II dCODE Dextramer reagents

allele	antigen	peptide
DRB1*0101	EBV (Epstein Bar Virus)	TSLYNLRRGTALA
DRB1*0101	TT (Tetanus Toxoid)	KIYSYFPSVISKV
DRB1*0101	CLIP (negative control)	PVSKMRMATPLLMQA

a the state of the state LABEL CELLS LIBRARY OF DNA BARCODE DEXTRAMERS **CELL SAMPLE** K ↔ **10X GENOMICS CHROMIUM** SORTED CELLS **CELL SORTING** TCR RECOGNITION TCR CLONOTYPE GENE EXPRESSION SEQUENCING CMV DEXTRAMER

Feature barcode workflow

Identification of EBV- and TT- specific TCR clonotypes in CD4+ T cells

	, chain	V	D	J	CDR3	# of cells
	1. α β	TRAV38-2/DV8 TRBV29-1	TRBD2-01	TRAJ27 TRBJ2-1	CALYNTNAGKSTF CSVDRGVGYEQFF	492
	2. α β	TRAV38-2/DV8 TRBV29-1	TRBD1-01	TRAJ27 TRBJ2-3	CAVYNTNAGKSTF CSVESAGAGDTQYF	50
EBV-specific T cells	3. α β β	TRAV38-2/DV8 TRBV29-1 TRBV29-1	TRBD2-01 TRBD1-01	TRAJ27 TRBJ2-1 TRBJ2-3	CALYNTNAGKSTF CSVDRGVGYEQFF CSVESAGAGDTQYF	36
	4. α β	TRAV38-2/DV8 TRBV29-1	TRBD2-01	TRAJ27 TRBJ2-7	CALYNTNAGKSTF CSAEEAGSGDEQYF	17
	5. α β	TRAV29/DV5 TRBV7-8	TRBD1-01	TRAJ30 TRBJ2-1	CAALRDDKIIF CASSSRGRLSIEQFF	9
TT-specific T cells						
	chain	V	D	J	CDR3	# of cells
	1. α β	TRAV14/DV4 TRBV20-1	TRBD1-01	TRAJ49 TRBJ1-4	CAMRGILTGNQFYF CSAKSPGQGYEKLFF	28
	2. α β	TRAV13-2 TRBV7-2	TRBD1-01	TRAJ22 TRBJ1-2	CAVSGGSGSARQLTF CASSLDGRGGGYTF	17
	3. α β	TRAV22 TRBV7-9		TRAJ20 TRBJ2-3	CAVGNDYKLSF CASSRTPDTQYF	9
	4. α β β	TRAV13-2 TRBV7-2 TRBV7-2	TRBD1-01 TRBD2-01	TRAJ22 TRBJ1-2 TRBJ1-4	CAVSGGSGSARQLTF CASSLDGRGGGYTF CASSLVVRNEKLFF	5
	5. α β	TRAV23/DV6 TRBV7-2	TRBD2-01	TRAJ40 TRBJ1-1	CAPESITSGTYKYIF CASSLDGRGTEAFF	3

Unveil a new understanding of adaptive immunity







immudex