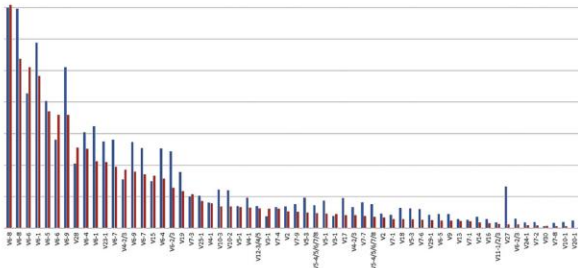


HS Diagnostics

T-cell profiles uncovered



T-cell receptor (TCR) profiling from the specialists:

Get the deepest look into TCRbeta-repertoires by our proprietary analysis pipeline.

From sample to result within days

HS Diagnostics T-cell profiles uncovered

HS Diagnostics Company Profile

We are specialists in T-cell beta receptor (TCRbeta / CDR3) profiling by ultra-deep sequencing.

- our proprietary technology is tested and optimized in hundreds of samples
- we can measure the T-cell repertoire in blood and tissue samples in maximal resolution down to the single TCR nucleotide sequence
- within days we can deliver a molecular view on TCRbeta profiles, a key to understanding of the adaptive immune system
- our TCRsafe™ procedure uses a unique two-step protection system, which efficiently eliminates carryover contamination
- we offer parallel analysis of large numbers of samples.



See the TCRbeta profile in a spread sheet:

pro-seq reads	total reads	V-gene no-ID	J-gene no-ID	Frame-shift	Frame Shift	ORF only	AAI	dup-seq insert	ORF-seq (AAI)
3.0967	18344	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	GAAGACTGAGGGCTTACTCTGTCGGGAGAGGAGGAGG...
1.5161	9146	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	GAGGACTGGGGCTTACTCTGTCGGGAGAGGAGGAGG...
0.9804	5828	V1-1*01	V1-9*01	change# 2	ORF	0	ORF	GAGGACTGGGGCTTACTCTGTCGGGAGAGGAGGAGG...	
0.9803	3824	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	GAGGACTGGGGCTTACTCTGTCGGGAGAGGAGGAGG...
0.9794	3433	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	GAGGACTGGGGCTTACTCTGTCGGGAGAGGAGGAGG...
0.4902	2714	V1-1*01	V1-9*01	change# 1	ORF	1	ORF	GAGGACTGGGGCTTACTCTGTCGGGAGAGGAGGAGG...	
0.3768	2380	V1-1*01	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.3765	2380	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.3764	1446	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.3680	1502	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.3627	1407	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.2599	1389	V1-1*01	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.2388	1302	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.2349	1296	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.2337	1289	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.2261	1238	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.2006	1038	V1-1*01	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.2003	1033	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1994	1004	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1987	1024	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1974	1004	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1712	1002	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1599	1001	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1529	902	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1491	886	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1406	884	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1423	876	V1-1*01/02	V1-9*01	change# 2	ORF	2	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...	
0.1420	862	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1382	836	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1378	828	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1344	803	V1-1*01/02	V1-9*01	change# 2	ORF	2	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...	
0.1341	802	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1340	799	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1332	792	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1306	788	V1-1*01/02	V1-9*01	change# 1	ORF	1	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...	
0.1309	787	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1271	789	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1262	766	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1258	762	V1-1*01	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1258	758	V1-1*01/02	V1-9*01	uk	0	ORF	0	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...
0.1258	756	V1-1*01	V1-9*01	change# 1	ORF	1	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...	
0.1247	755	V1-1*01/02	V1-9*01	change# 2	ORF	2	ORF	AGCGAGACTCTTACTCTGTCGGGAGAGGAGGAGG...	



HS Diagnostics T-cell profiles uncovered

T cells play a central role in cell-mediated immunity.

- 95 % of T-cells express a T-cell receptor (TCR) with a beta chain on their surface.
- This TCRbeta chain is highly diverse (more than 1 x 10⁶) and specific like a fingerprint.
- TCRbeta recognizes antigens bound to major histocompatibility complex molecules.

Applications for TCRsafe™

Characterization of T-cell profiles in development and disease, such as

- Determination of T-cell repertoires
- Detection of T-cell clonality
- Support for T-cell therapy

Innovative applications:

- TCRbeta signatures as biomarkers in clinical vaccination studies
- Identification of common “public TCRs” in autoimmune disease as therapeutic targets
- TCRs and tumor antigens – novel and promising approaches in cancer therapies

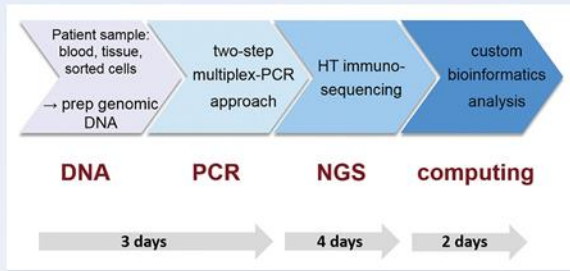
Breakthrough of the Year 2013
Science 342, 20 December 2013

Cancer Immunotherapy T cells on the attack

“This year marks a turning point in cancer, as long-sought efforts to unleash the immune system against tumors paying off ...”

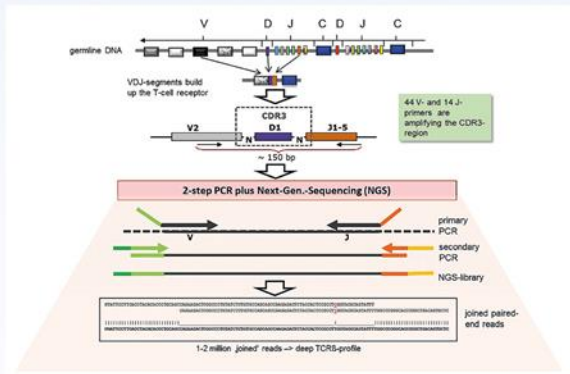


TCRsafe™



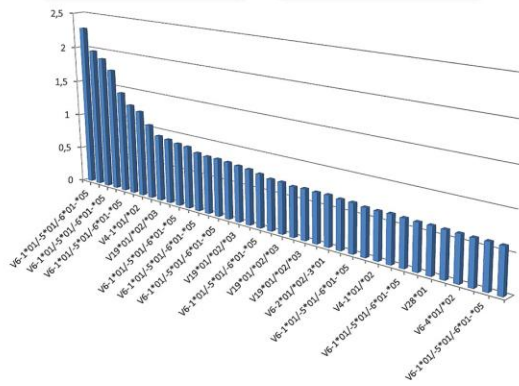
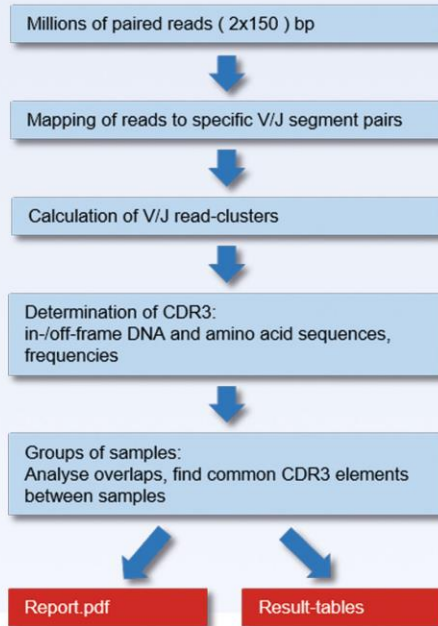
In our hands, processing of samples from DNA to ready-made TCRbeta profiles is a matter of days.

TCRsafe™ uses a 2-step PCR-approach. We start from genomic DNA with our proprietary and highly specific primer sets, which are deliberately calibrated to provide even amplification rates for diverse V/J combinations.



TCRsafe™ Bioinformatics pipeline

An essential part of our service is the analysis pipeline, which integrates all steps starting from the millions of raw reads up to the final profile tables and reports.



Who we are:

HSDiagnomics was founded in late 2012. Inspired by several years of research about T-cell receptors and the enormous possibilities of modern Next-Generation-Sequencing plus tailored bioinformatics tools we came to the conclusion that our protocols and methods for target specific amplification of TCRbeta loci from genomic DNA samples provide a key to profiling and understanding of the adaptive immune system. With our proprietary TCRsafe™ technology, which we developed carefully over the last 2 years, we believe that even large-scale screens on TCRbeta profiles under various conditions can be carried out in a robust and quantitative way, without risk of carryover contamination.

HSDiagnomics offers a fully integrated service to its customers, which opens new possibilities for all scientific and R&D projects investigating the role of T-cells under diverse conditions (treatments, vaccination, diseases, etc.). With our experts and technology at hand our customers will save time, budget and staff resources, since there is no need to set up and evaluate primer systems or develop dedicated software solutions. Within days we can deliver results, which bring you directly to the real important questions.

HSDiagnomics is grateful to the Investitionsbank Berlin and the EU for funding by the ProFIT program.



Our partners:

- Charite, dept. of Experimental Hematopathology
- Univ. Hospital Erlangen, dept. of Internal Medicine 5 - Hematology/Oncology
- SINA Sciences GmbH
- Oceanbasis GmbH
- Fasteris SA, Switzerland

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