

e-book  
February 2023



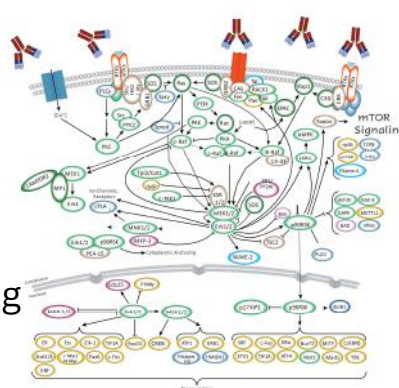
# Hyperplex™ Phosphoprotein Profiling

- 1,250-plex Cell Signaling Analysis
- Phosphorylated/un-phosphorylated Proteins
- Target Engagement & Drug Efficacy
- Drug Repurposing & Repositioning
- Design of Combination Therapies

# #Hyperplex™ Cell Signaling Analysis

## Sensitivity: The Power of Targeted Phospho-Proteomics.

Cell signaling analysis has become a key factor in understanding disease mechanisms and modulation. Unlike shotgun proteomics, Hyperplex™ allows highly sensitive, targeted quantification of un/phosphorylated proteins along various signaling pathways from minimal sample.

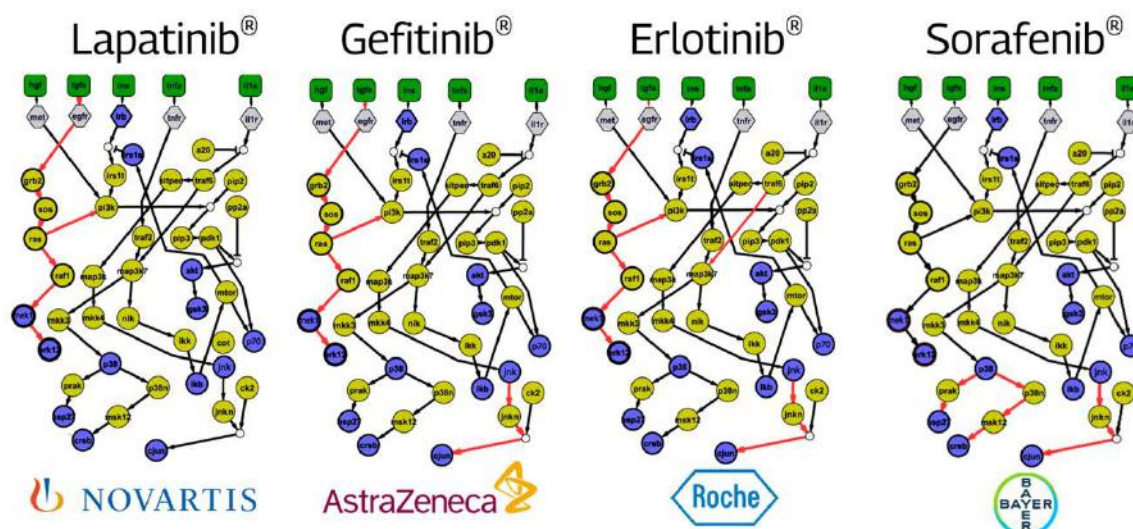


MAPK  
Signaling

## Relevance: Expert-curated Biomarkers and Signaling Pathways.

Hyperplex™ Protein Profiling is a targeted approach. The new 1,250-plex assay menu covers the most relevant 10% of the proteome including PTM. Hyperplex™ allows to select markers based on 20 years of peer-reviewed biomarker discovery.

And yes, custom antibodies can be added to any panel!



Compound  
Benchmarking [1]

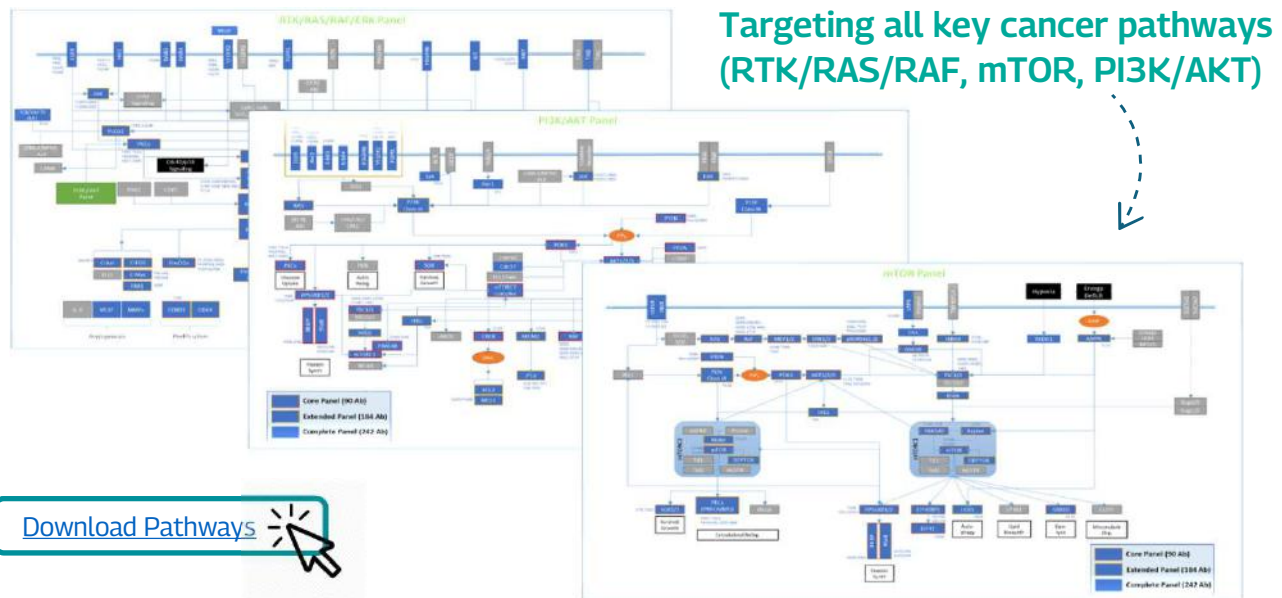
Gefitinib®/Iressa® are brands of AstraZeneca. Erlotinib®/Tarceva are brands of Roche/Genentech. Sorafenib®/Nexavar® are brands of Bayer AG.

[1]: Mitsos et al. <https://doi.org/10.1371/journal.pcbi.1000591>

## #Benefits

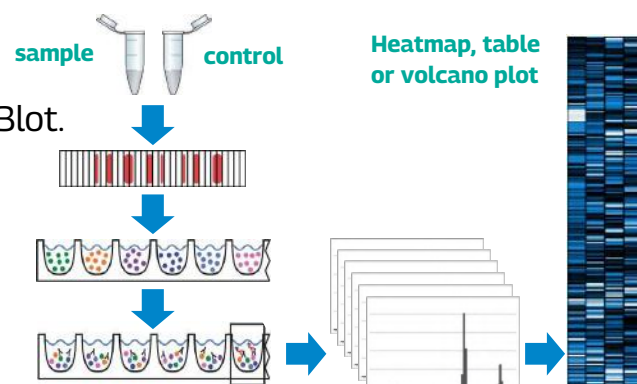
### How can Hyperplex™ Protein Profiling accelerate your research?

- Sensitivity: Hyperplex™ is by far the most sensitive platform on the market.
- Coverage: Hyperplex™ enables the most comprehensive pathway profiling.
- Compatibility: Combine Hyperplex™ PTM analysis with soluble protein profiling (e.g. Olink®).



## #Technology

- Electrophoresis-enhanced Western Blot.
- Proteins are barcoded.
- Up to 1,250 antibodies per sample.
- FACS readout, CV< 9%.
- Publication: [Treindl et al, 2016](#)



## #Sample Types

- PBMC, cell culture, 2D/3D cells, organoids, sorted cells
- Biopsies, tissue sections, PDX
- Sample requirements: 15-40 µg of total protein

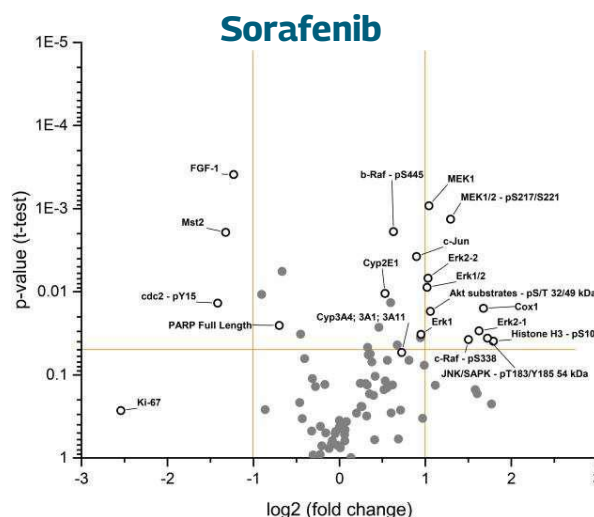
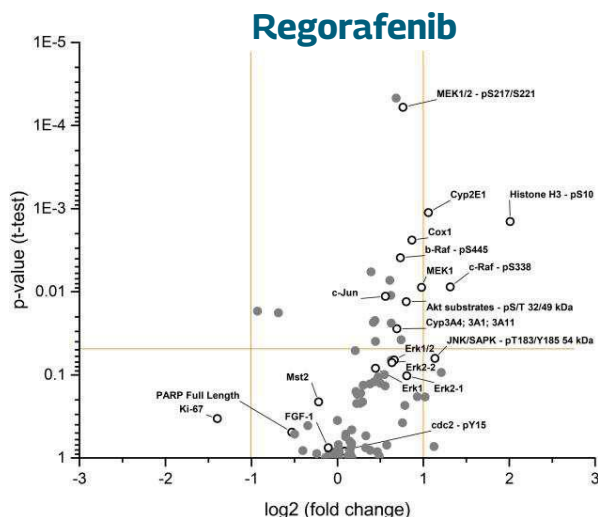


## #Case Studies

### #1: Combination Therapy

Bayer used Hyperplex™ to investigate synergies of a Regorafenib+Sorafenib combination therapy (Disease: hepatocellular carcinoma).

Samples: Biopsies from PDX mouse models (Publication: [Kissel et al., 2017](#))

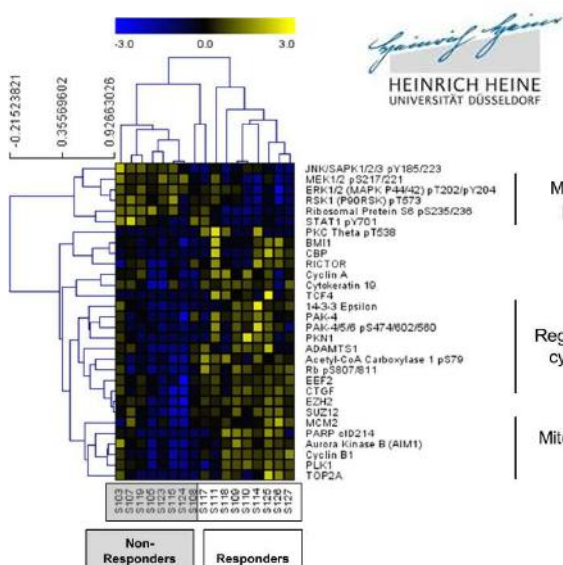


### #2: Translational Oncology

Phase 1 study on tumor samples (ovarian cancer) comparing responders vs. non responders identifies EZH2 as translational biomarker. (Publication: [Naskou et al., 2020](#))

### #3: Biomarker Discovery

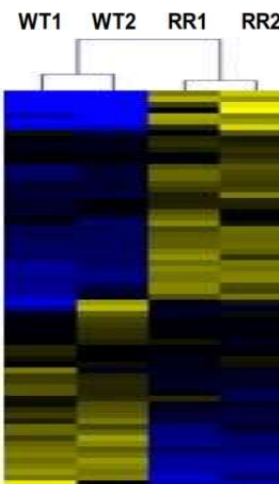
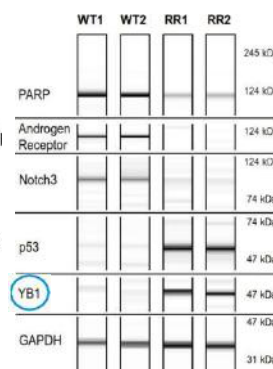
Hyperplex™ was used for the discovery of clinically relevant markers of radio-resistance. (Publication: [Inder et al., 2019](#))



MAPK/ERK  
pathway

Regulation of cell  
cycle process

Mitotic cell cycle  
process



# #The Panels: Cell Signaling and Metabolism

Reactivity	human	mouse	rat	dog	minipig	cynomolgus
<b>Cellular Signaling Pathways Panels</b>	907	889	382	303	396	359
<b>Signaling Panels</b>	567	546	234	183	240	219
FGF signaling pathway	110	114	54	44	60	55
EGF receptor signaling pathway	263	260	117	85	125	111
ErbB signaling and resistance	34	38	16	10	17	16
MAPK signaling pathway	350	337	149	116	157	144
PDGF signaling pathway	127	133	56	38	58	55
VEGF signaling pathway	132	132	60	41	60	56
Ras signaling pathway	590	577	248	191	249	223
PI3K-Akt signaling pathway	302	298	120	96	129	119
mTOR signaling pathway	142	140	53	39	59	54
JAK/STAT signaling pathway	90	83	38	32	43	38
<b>G-Protein</b>	155	153	72	55	71	70
G-protein coupled receptor signaling pathway	69	68	36	24	37	34
cAMP signaling pathway	114	110	49	41	49	50
<b>Developmental Pathways</b>	352	362	156	124	152	142
Hippo signaling pathway	81	87	40	39	45	40
Hedgehog signaling pathway	40	38	16	13	14	15
Notch signaling pathway	80	84	37	28	38	31
BMP signaling pathway	38	38	20	18	21	17
TGF-beta signaling pathway	108	114	48	35	46	42
Wnt signaling pathway	210	210	95	75	91	88
<b>Stress and Metabolism</b>	462	456	195	154	199	181
Hypoxia and HIF-1 signaling pathway	207	203	88	71	94	88
Oxidative stress response	205	202	86	68	84	77
JNK cascade	66	72	27	28	32	28
p38 MAPK pathway	52	54	30	17	25	22
AMPK signaling pathway	96	92	27	25	34	33
Insulin signaling pathway	225	224	103	68	95	90
<b>Immune Signaling and Inflammation</b>	407	380	185	150	191	162
B cell receptor signaling pathway and activation	119	109	53	43	57	52
T cell receptor signaling pathway and activation	198	178	82	69	82	74
Interferon-gamma signaling pathway	65	68	32	26	27	26
Toll-like receptor signaling pathway	98	94	41	36	47	38
NF-kappa B signaling pathway	155	135	70	61	78	65
Inflammation mediated by chemokine and cytokine signaling pathway	239	226	102	79	108	91
<b>Cell Death Pathway Association</b>	654	649	284	230	287	253
FAS signaling pathway	42	45	22	17	24	23
Apoptosis signaling pathway	486	480	221	177	217	193
p53 signaling pathway	190	191	74	67	90	82
Autophagic processes	205	200	86	63	83	77
TNF signaling pathway	158	163	67	51	68	55
Cellular response to DNA damage stimulus	109	107	41	33	44	36
DNA repair	57	62	24	24	27	22
<b>Other Pathways</b>	657	634	277	215	283	254
FoxO signaling pathway	135	136	55	51	58	55
Cadherin signaling pathway	52	48	27	19	29	27
CCKR signaling map	213	210	113	79	102	94
Endothelin signaling pathway	63	64	28	21	32	30
Integrin signaling pathway	179	182	80	56	83	76
Signal transduction	559	537	229	181	235	208

Signaling  
Panels

← validated  
species

← Immune  
signaling

Customize  
your panel

[Download Assay Configurator](#)

# #Cancer, Neurology, Immunology

Reactivity	human	mouse	rat	dog	minipig	cynomolgus
Other Panels	944	923	397	304	405	361
Cancer Panels	448	456	196	154	197	185
Pathways in cancer	322	337	148	117	143	138
Central carbon metabolism in cancer	105	98	40	33	48	43
Acute myeloid leukemia	97	94	40	31	43	38
Bladder cancer	88	92	35	23	31	28
Breast cancer	154	162	61	54	64	63
Chronic myeloid leukemia	122	124	51	45	54	45
Colorectal cancer	137	140	65	58	67	64
Endometrial cancer	126	125	59	51	65	63
Glioma	114	114	41	34	43	41
Melanoma	114	112	47	41	48	45
Non-small cell lung cancer	133	130	54	44	53	50
Pancreatic cancer	136	141	58	50	59	54
Prostate cancer	156	156	64	55	68	65
Renal cell carcinoma	84	78	41	34	40	38
Small cell lung cancer	183	180	79	61	75	71
Thyroid cancer	58	61	28	23	23	22
Angiogenesis	228	232	101	80	107	101
Cell Cycle and Proliferation	515	519	225	183	235	218
Cell Cycle	276	291	129	106	130	116
Cell growth and proliferation	515	519	225	183	235	218
Diseases	312	315	154	124	152	137
Alzheimer disease	184	186	87	71	90	87
Hepatitis B	190	190	90	73	96	81
Huntington disease	89	96	45	36	44	42
Parkinson disease	46	42	29	18	24	23
Immune Processes	380	356	157	114	152	132
Innate immune response	80	64	31	21	26	20
Inflammatory response	133	125	54	40	55	43
Immune response	557	528	236	182	241	212
Leukocyte migration	41	39	22	14	19	17
Neutrophil degranulation	51	42	23	16	23	22
Response to virus	197	199	85	64	82	71
T Cell Maturation	146	148	66	55	64	60
T cell differentiation	116	119	50	41	47	43
Thymus development	38	37	22	18	21	21
Other Processes	693	681	292	229	295	266
Response to drug	202	194	90	68	79	72
Cell migration	233	222	99	81	106	95
Platelet	151	140	72	48	73	65
Transcription and gene expression	474	465	197	157	199	176
Protein ubiquitination	128	137	57	49	61	55
Pathway Activity Panels	242	217	87	60	97	87
Core Druggable Pathway Panel	90	86	37	23	43	39
Extended Druggable Pathway Panel	184	171	70	45	77	69
Full Druggable Pathway Panel	242	217	87	60	97	87
mTOR Pathway	119	111	39	29	47	42
PI3K / AKT Pathways	166	146	54	43	64	58
RAS / RAF / ERK Pathways	126	114	45	26	48	43

← validated species

20  
Cancer  
Panels

CNS  
Diseases

Customize  
your panel

← druggable pathways!

[Download Assay Configurator](#)

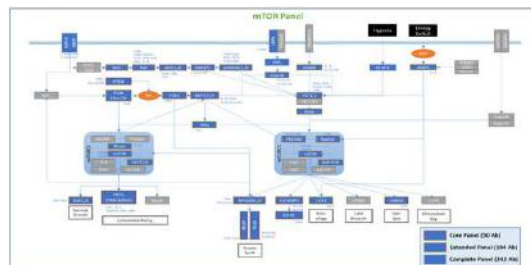




# #Assay Configurator: Customize your panel

*Cell Signaling Research: Just have it your way!*

- Quantify up to 12,50 proteins per sample.
- Profile 50+ signaling pathways in one go
- Customizable for every project
- Freedom to add custom antibodies



*The mTOR pathway panel - one of 50 validated panels*

## #How to order?

*Cell Signaling: Accelerate your research with just a few clicks!*

- Download the assay configurator here
- Select one or more species
- Select pathway activity panels
- Select druggable pathways
- Save the file and e-mail to [hello@assay-engineers.com](mailto:hello@assay-engineers.com)
- Get your cost estimate within 2 days.

[Download Hyperplex Assay Configurator](#)

## #Talk to a scientist!

*Schedule a web meeting with an expert*

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