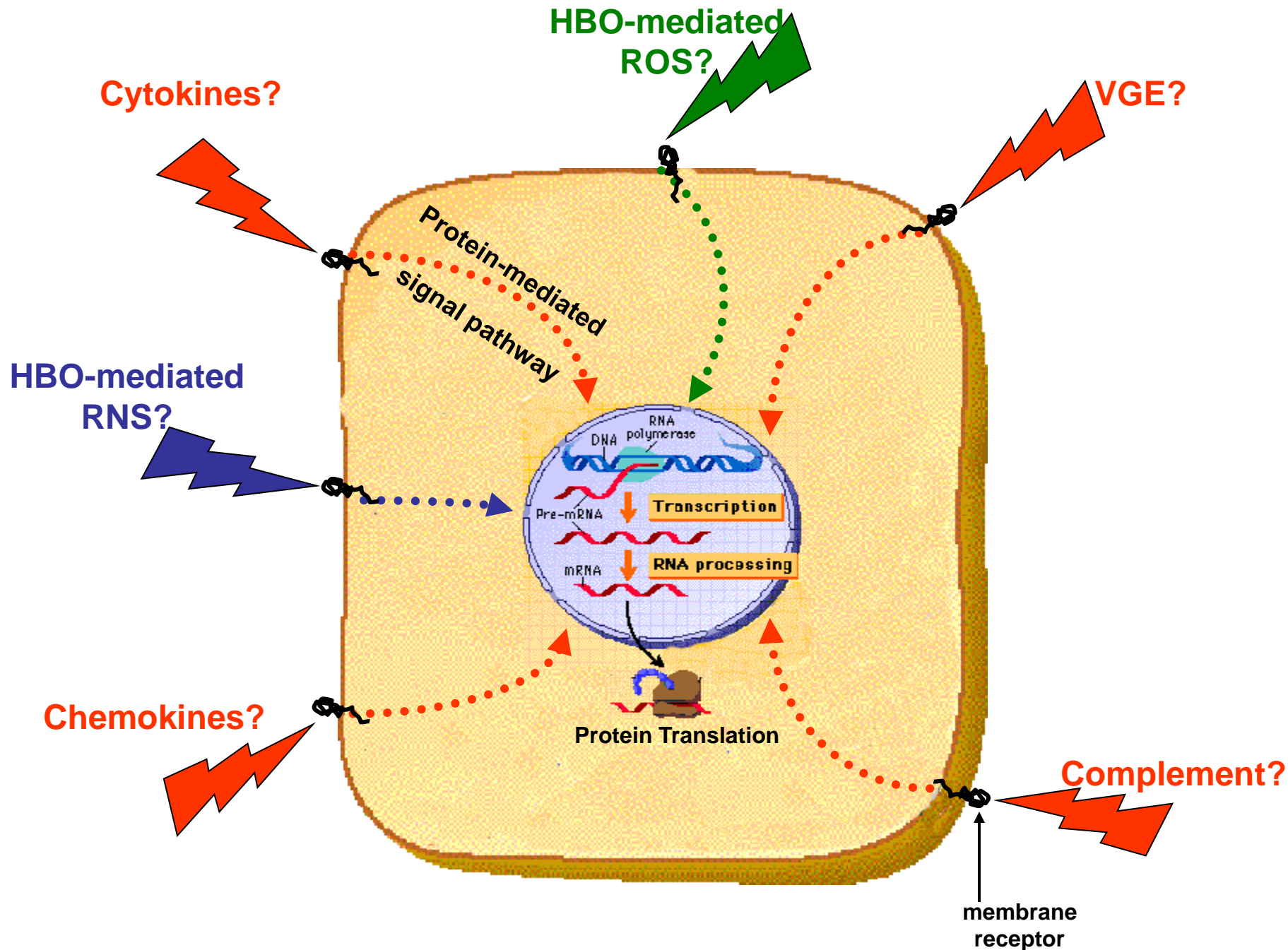


EXTENDED OXYGEN DECOMPRESSION INCREASES TRANSCRIPTION ACTIVITY IN PERIPHERAL BLOOD LEUKOCYTES IN NAVY CLEARANCE DIVERS DURING TRIMIX DIVING

Cameron BA¹, Virtanen C², Holden N¹

¹Defence R&D Canada, Toronto, ² Ontario Cancer Institute
Genomics Centre, Toronto, Canada

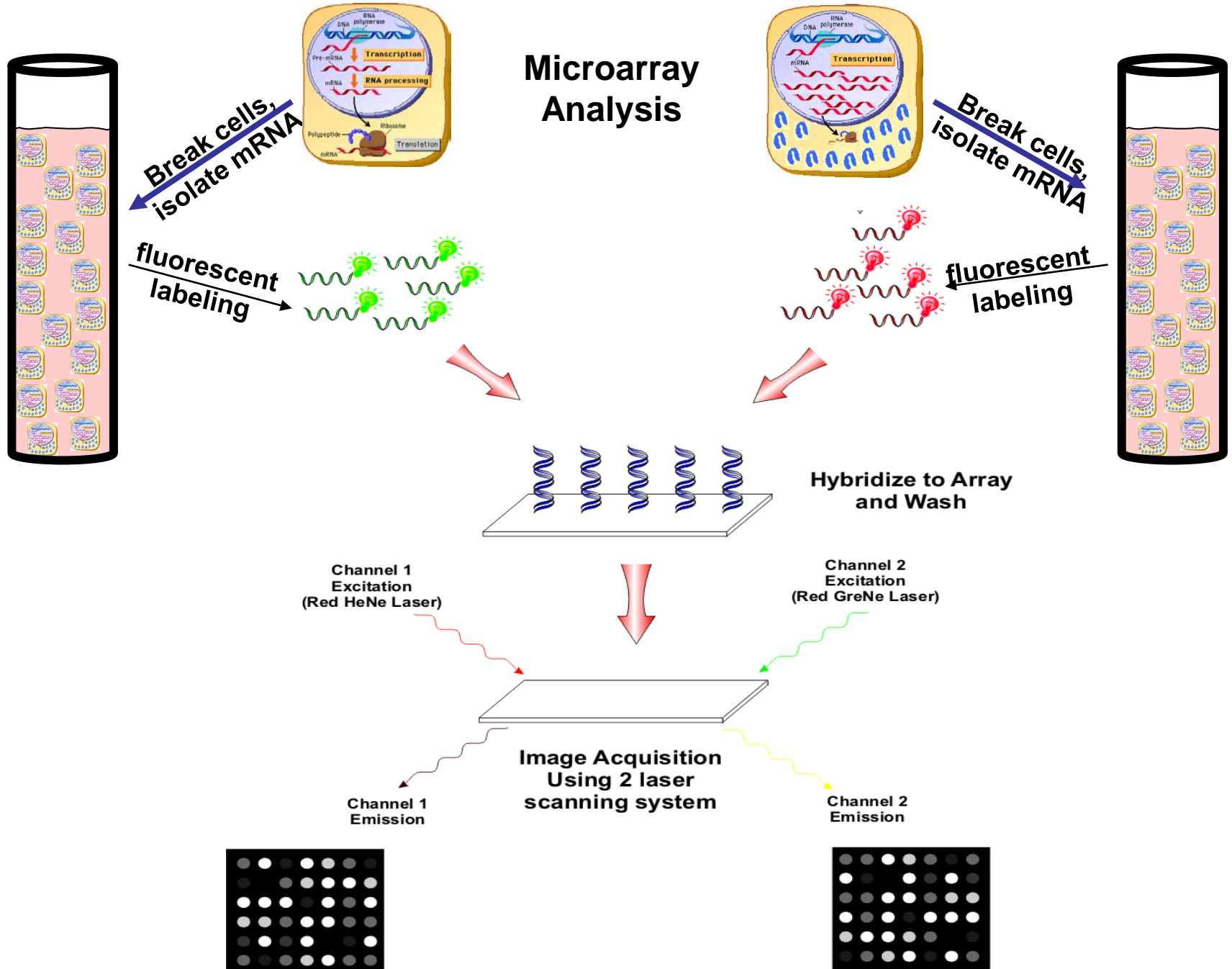
bruce.cameron@drdc-rddc.gc.ca



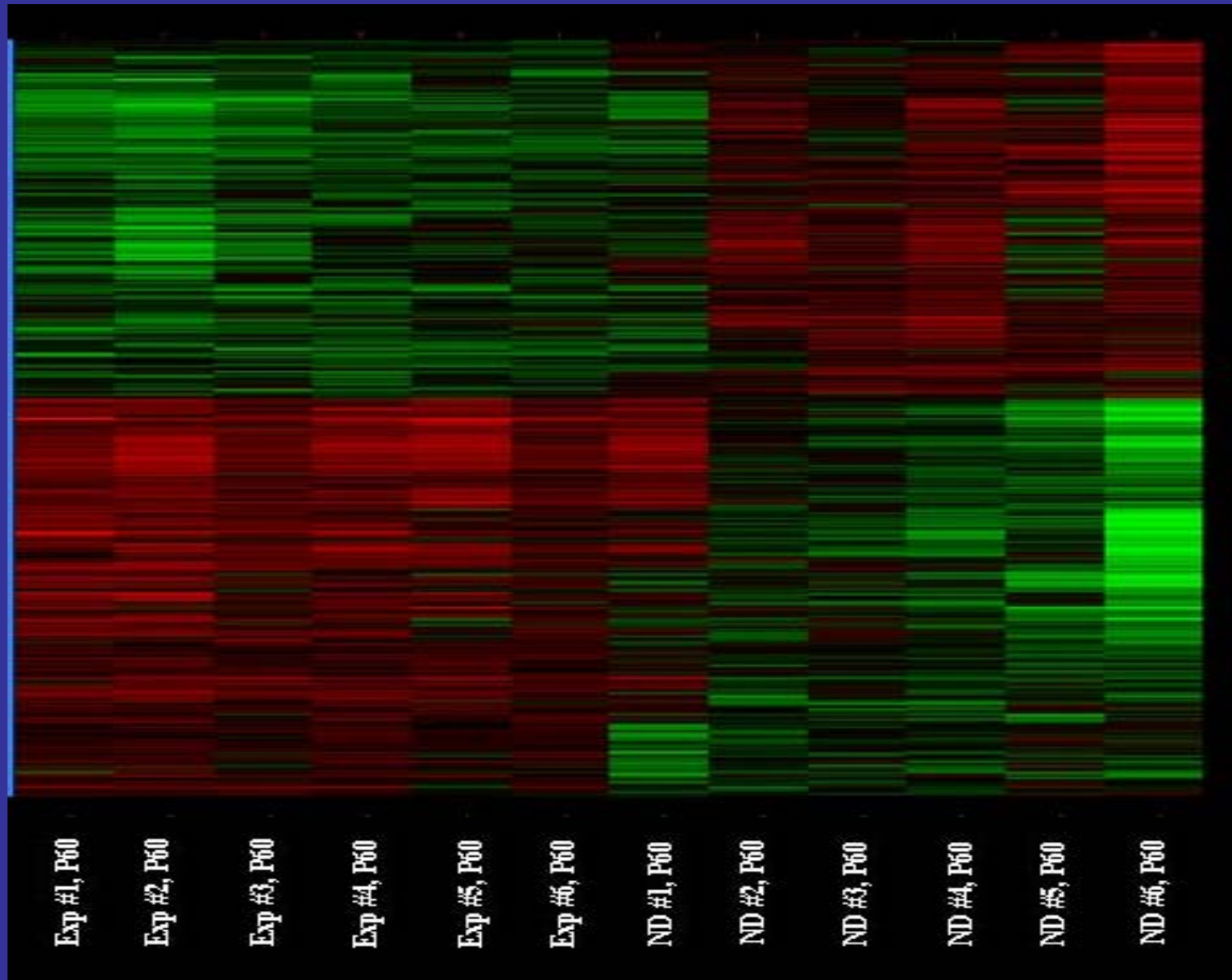
Reference Sample

Experimental Sample

Microarray Analysis



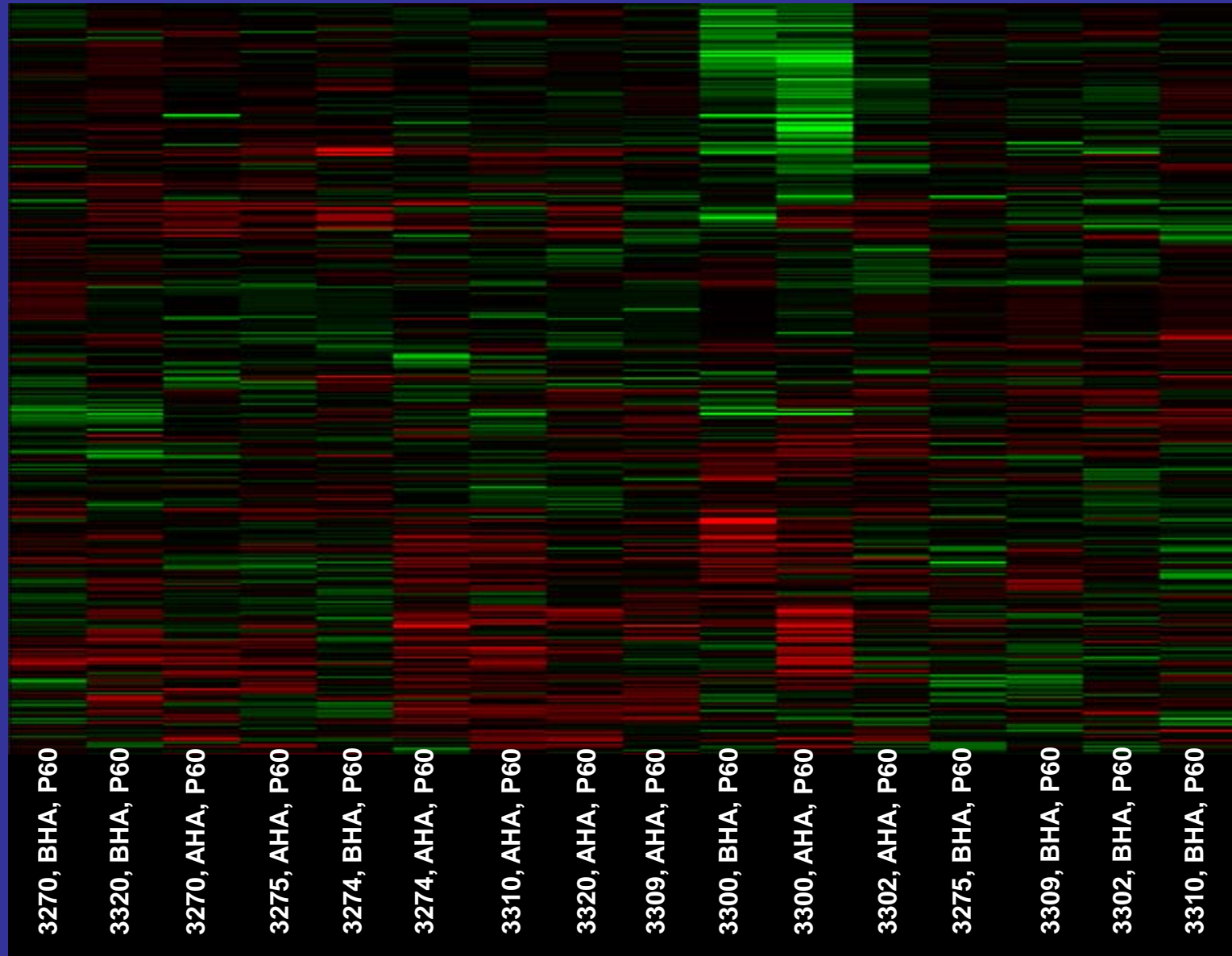
41,000 genes $\xrightarrow{\text{Paired t-test}}$ 5000 genes



45 msw for 30 min dry air dive

41,000 genes $\xrightarrow{\text{Paired t-test}}$ 400 genes

18 msw
for 60
min dry
air dive

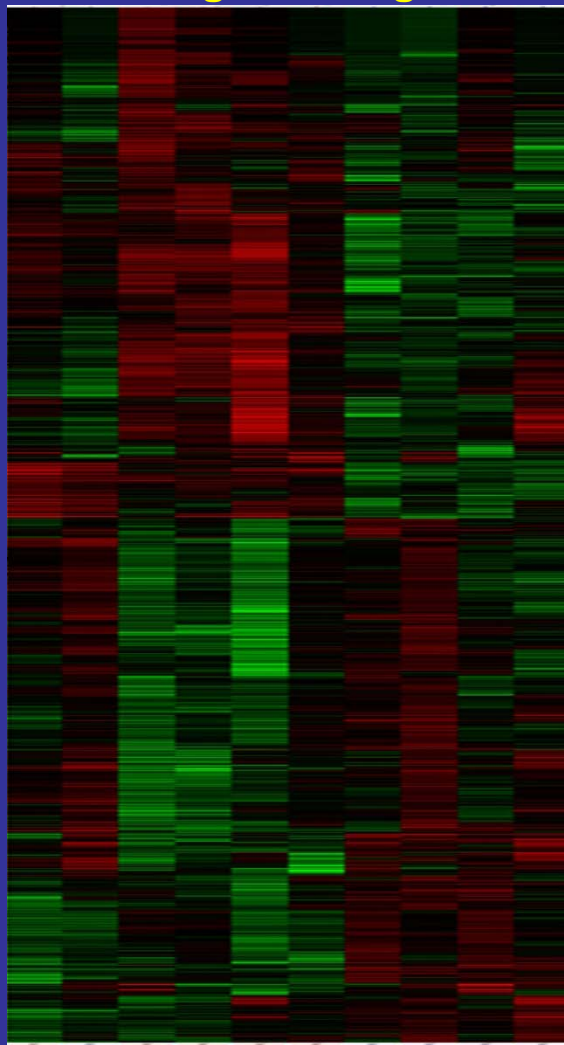


BFA-Before Heat Acclimation

AFA-After Heat Acclimation

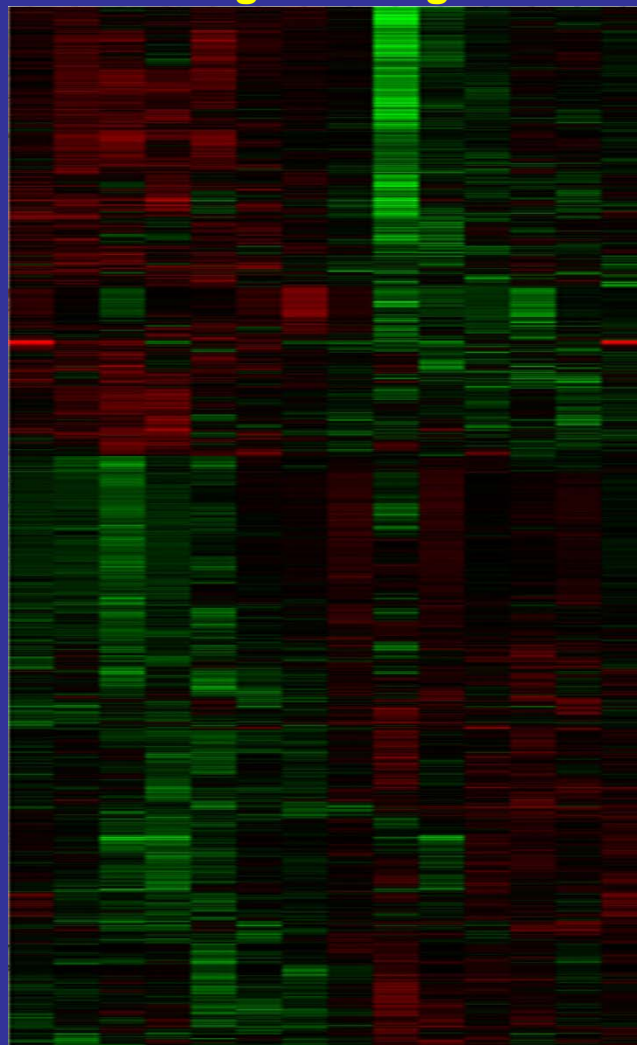
Transcription Activity in Trimix Diving, GeneSpring®

60 msw for 20 min
2386 significant genes



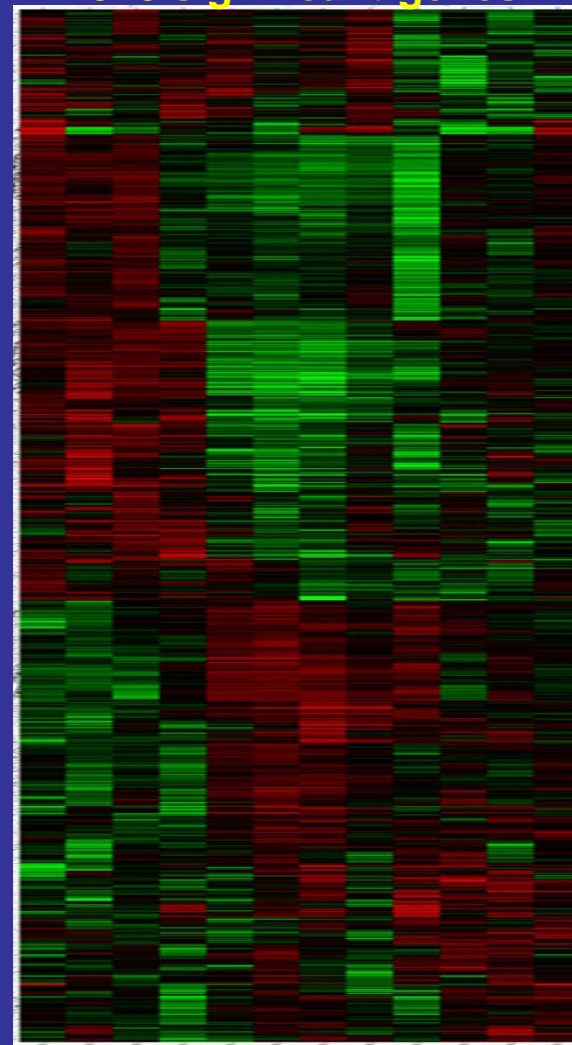
3170 P60
3170 Pre
3346 P60
3348 P60
2710 P60
1777 P60
3348 Pre
1777 Pre
3346 Pre
2710 Pre

69 msw for 20 min
3910 significant genes



1777 P60
2907 P60
3347 P60
3345 P60
3052 P60
3170 P60
3348 P60
3348 Pre
3347 Pre
3345 Pre
3170 Pre
2907 Pre
3052 Pre
1777 Pre

81 msw for 20 min
1320 significant genes

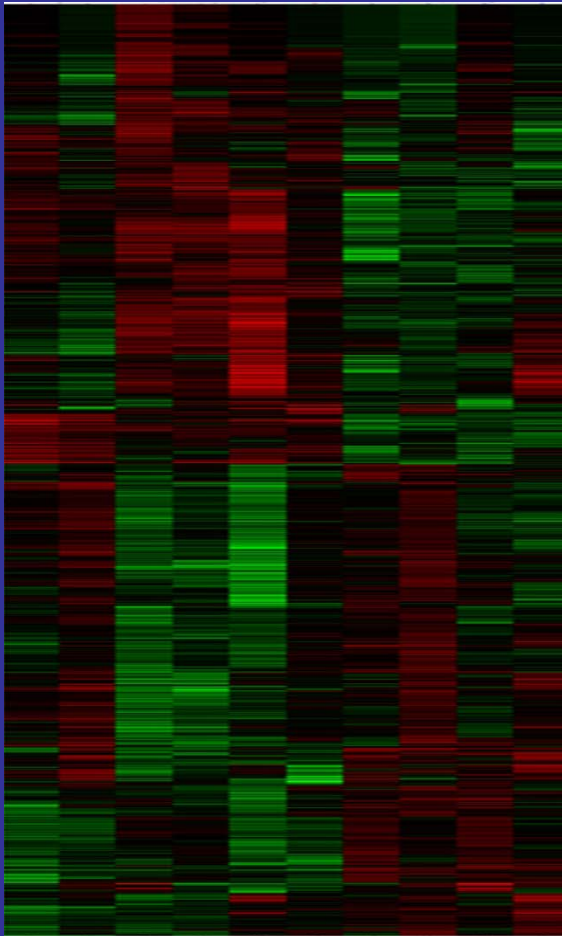


3347 P60
3345 P60
2170 P60
3346 P60
3052 P60
3052 Pre
3336 Pre
3336 P60
3346 Pre
2170 Pre
3345 Pre
3347 Pre

Transcriptional Activity in Trimix Diving, GeneSpring®

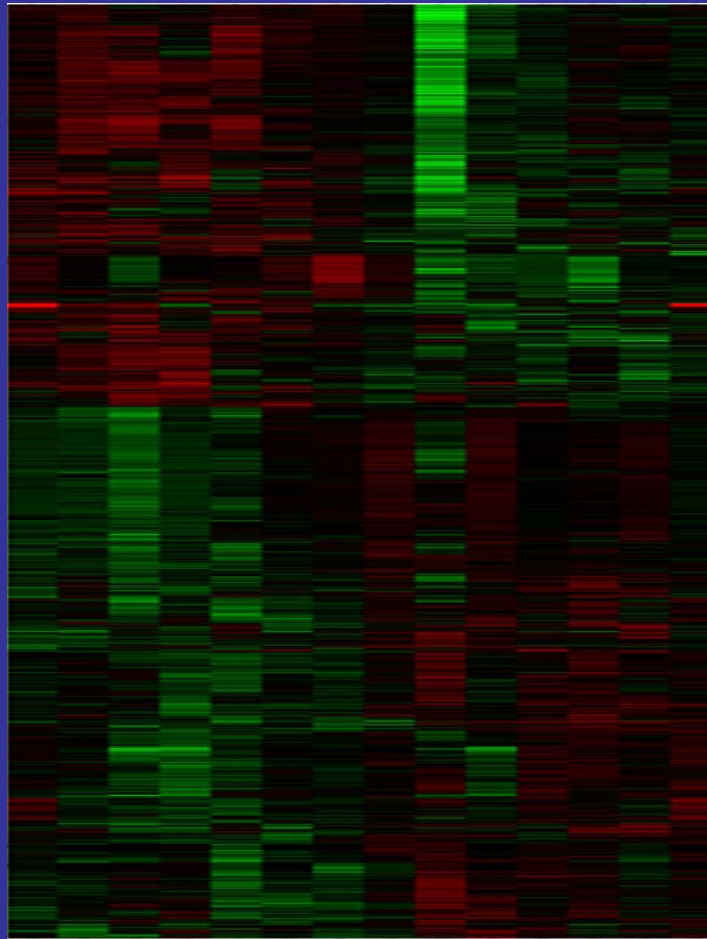
60 msw for 20 min

2386 significant genes



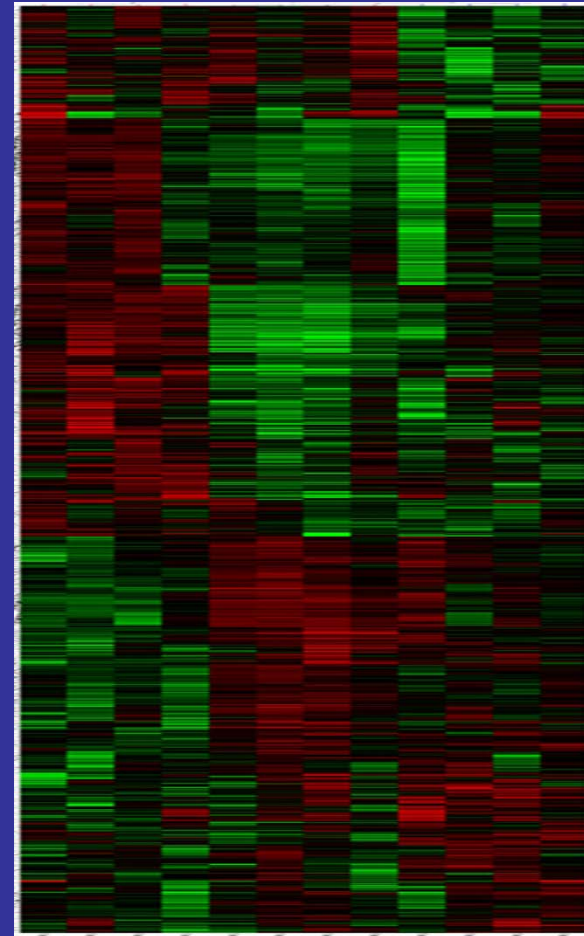
69 msw for 20 min

3910 significant genes



81 msw for 20 min

1320 significant genes



P60

Pre

16 min gas deco
42 min O₂ deco

22 min gas deco
54 min O₂ deco

30 min gas deco
70 min O₂ deco

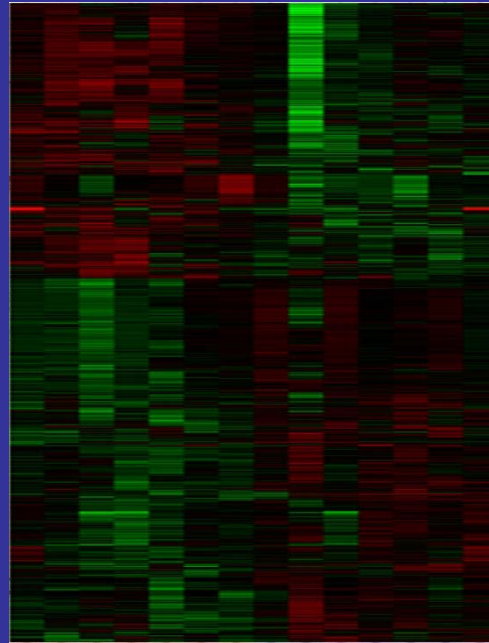
Transcriptional Activity in Trimix Diving, GeneSpring®

69 msw for 20 min

30 min gas deco
54 min O₂ deco

22 min gas deco
54 min O₂ deco

22 min gas deco
70 min O₂ deco



Control

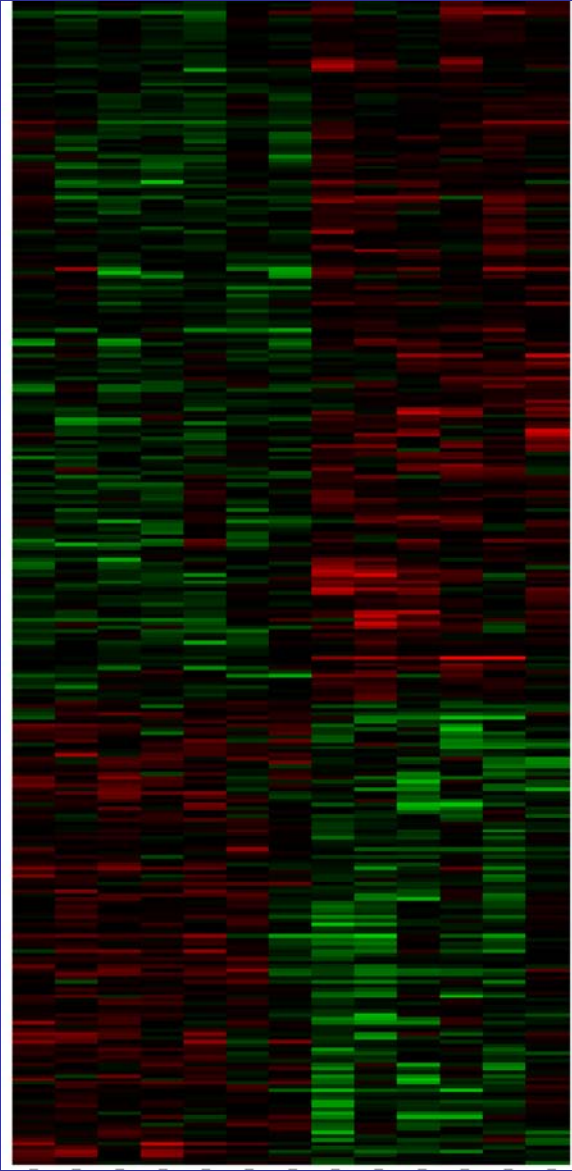
Hypothesis

Disturbed pattern?
Differently expressed genes?
Different transcriptional activity?

Hypothesis

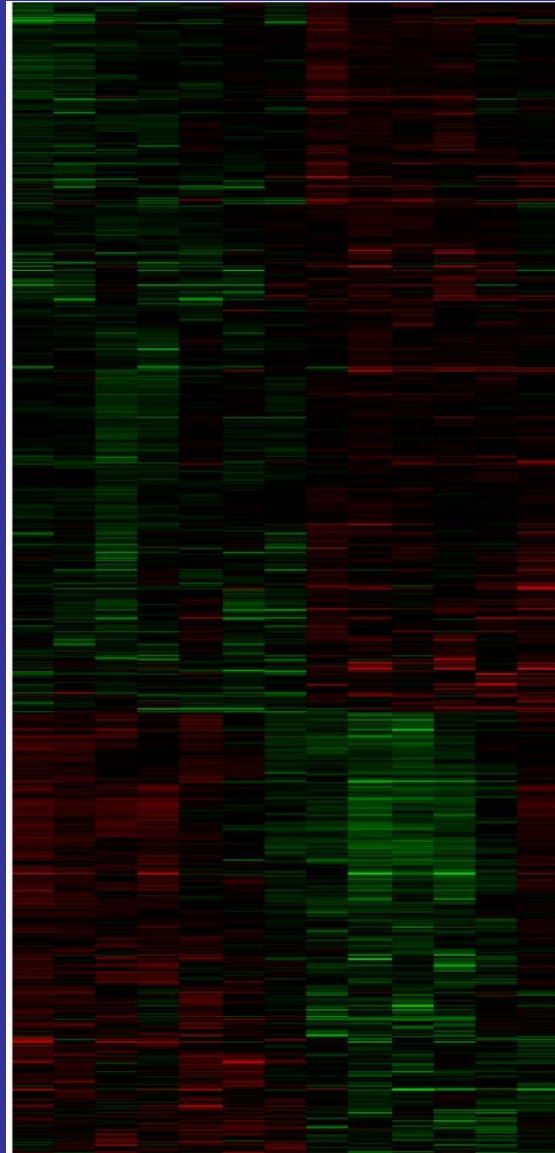
Disturbed pattern?
Differently expressed genes?
Different transcriptional activity?

Extended Trimix Deco



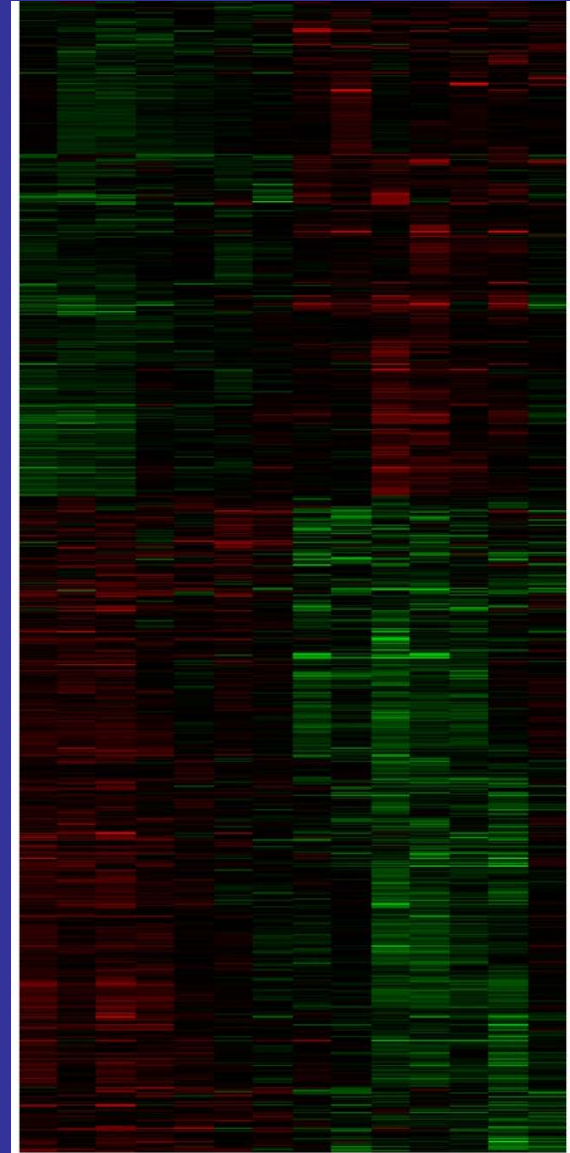
3022, P75
3411, P75
3419, P75
3418, P75
3420, P75
3336, P75
3413, P75
3336, Pre
3413, Pre
3420, Pre
3419, Pre
3418, Pre
3411, Pre

Normal Deco

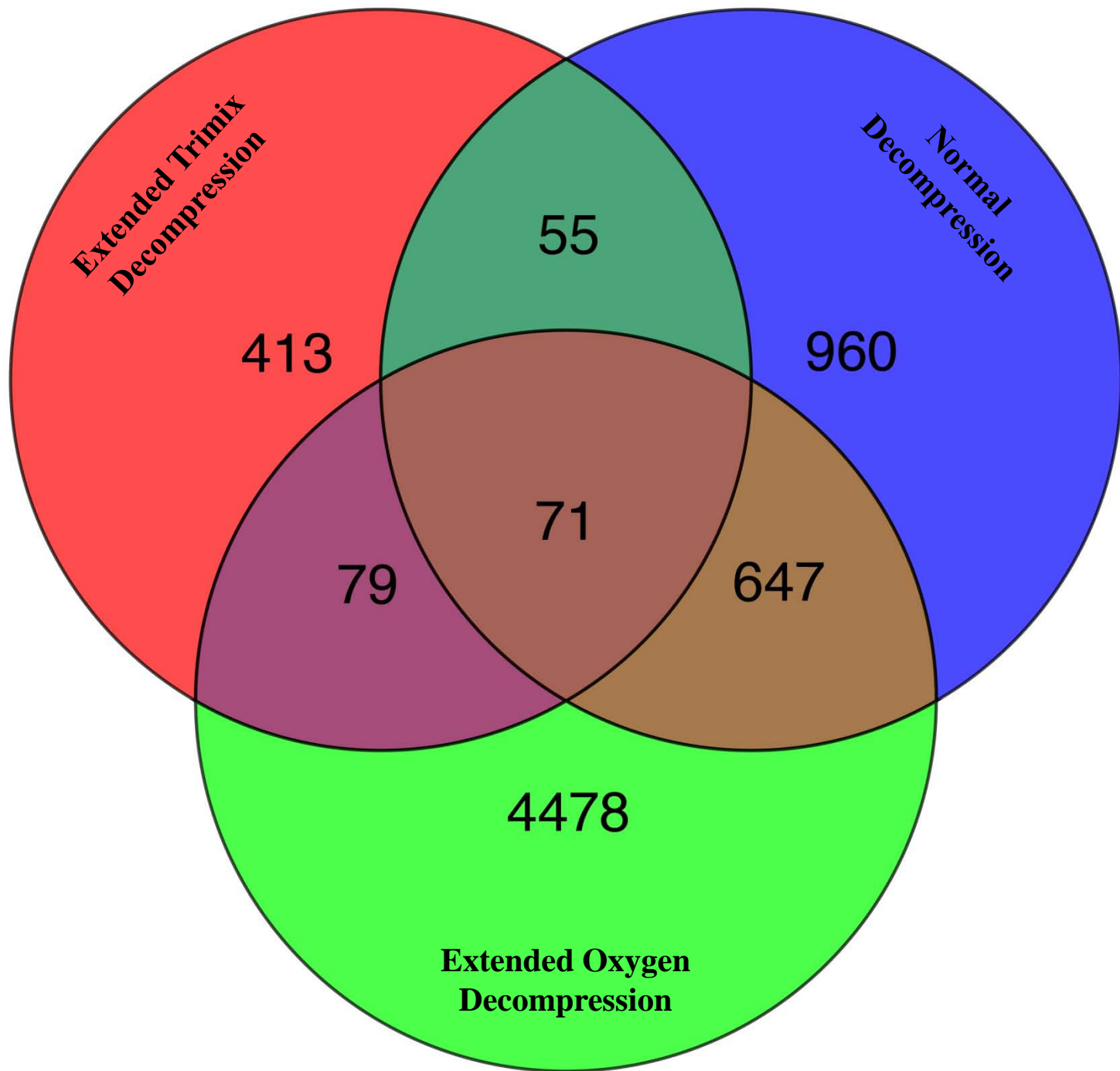


3022, P75
3411, P75
3418, P75
3419, P75
3336, P75
3420, P75
3413, P75
3336, Pre
3413, Pre
3420, Pre
3418, Pre
3411, Pre
3419, Pre

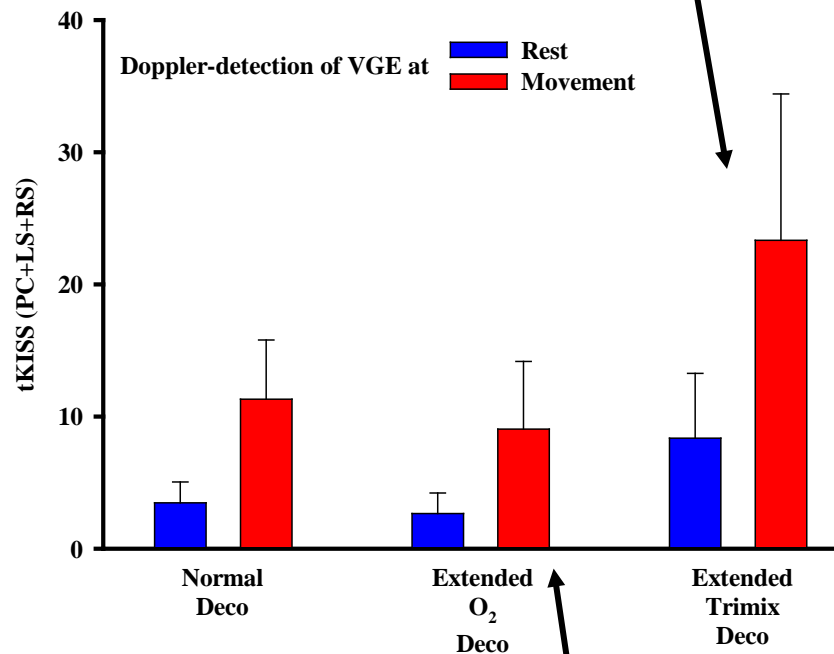
Extended Oxygen Deco



3022, P75
3336, P75
3411, P75
3418, P75
3413, P75
3419, P75
3420, P75
3022, Pre
3411, Pre
3420, Pre
3418, Pre
3413, Pre
3419, Pre
3336, Pre



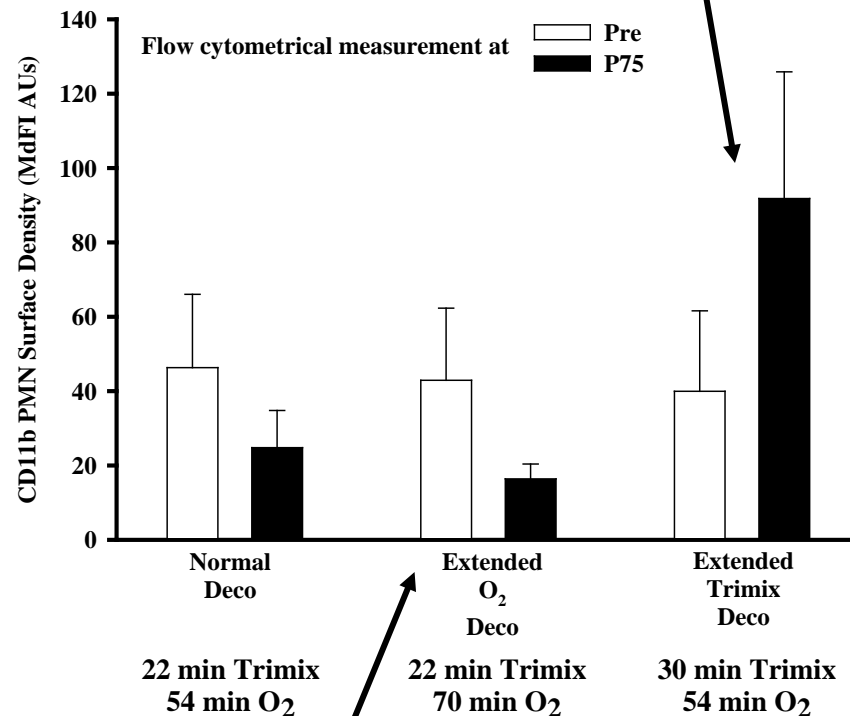
Extended Trimix caused the highest levels of VGE



Extended Oxygen caused the lowest levels of VGE

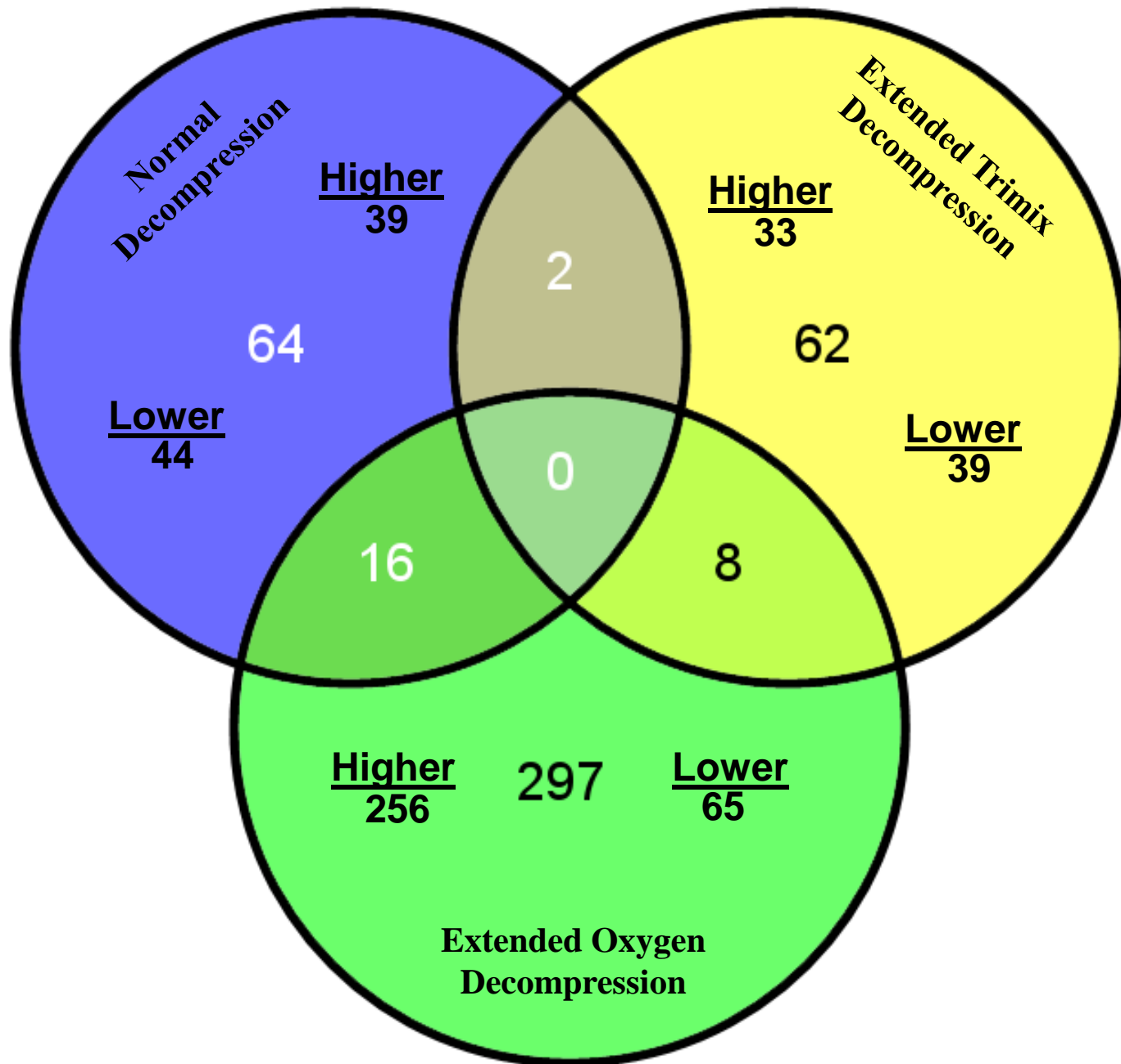
&

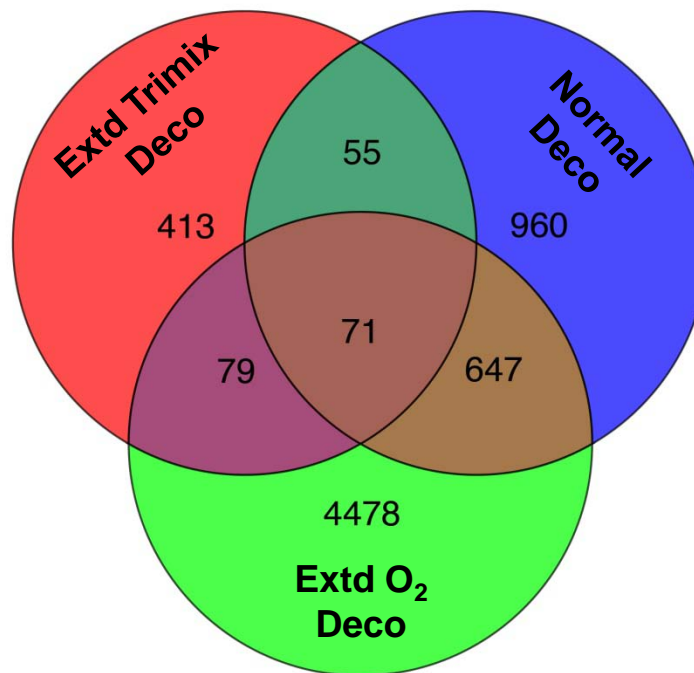
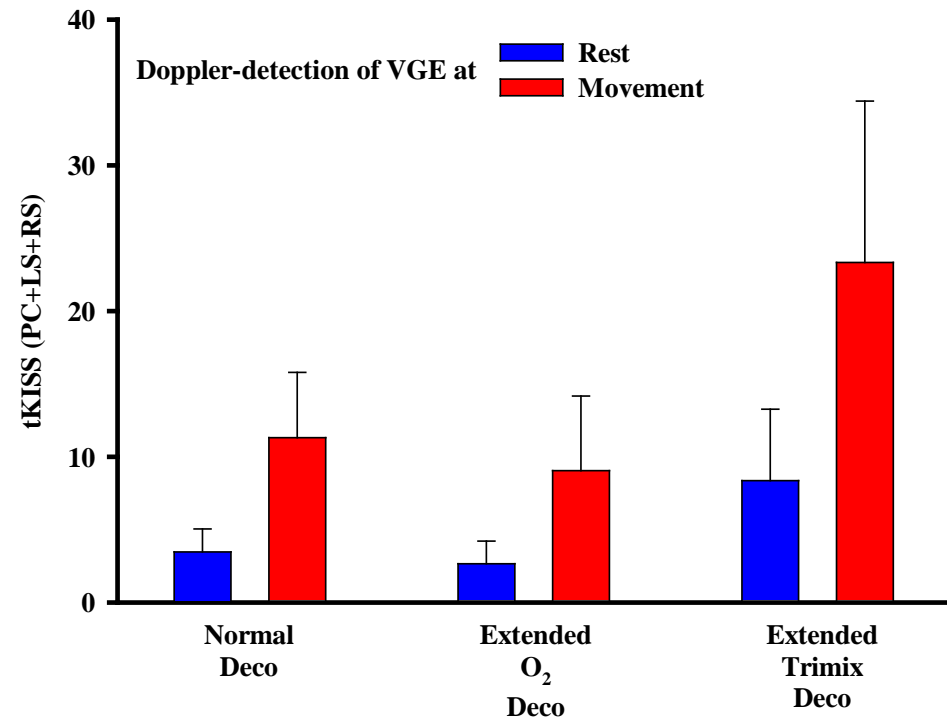
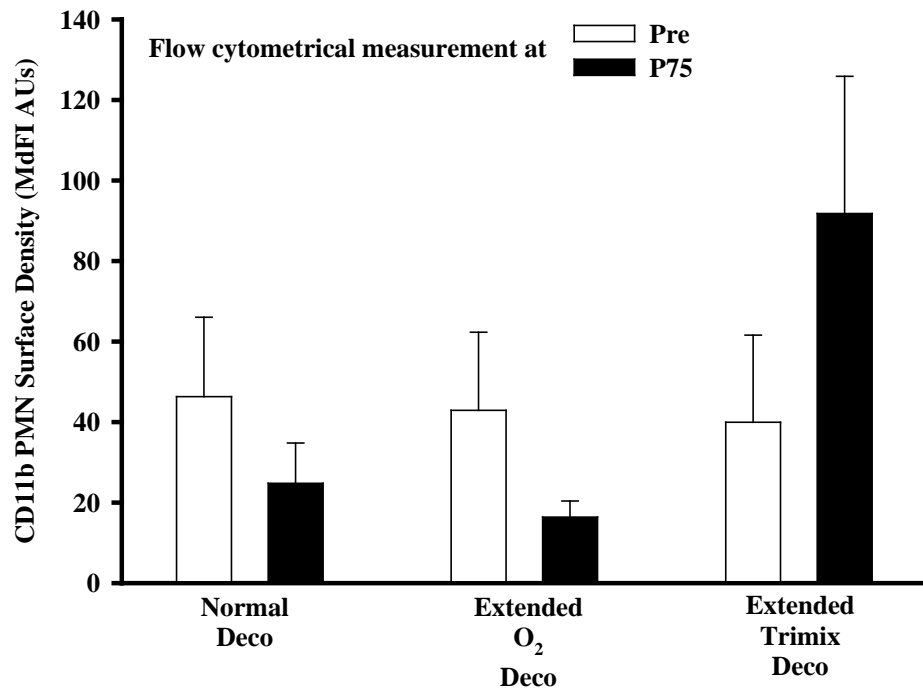
the highest levels of immunoinflammatory response

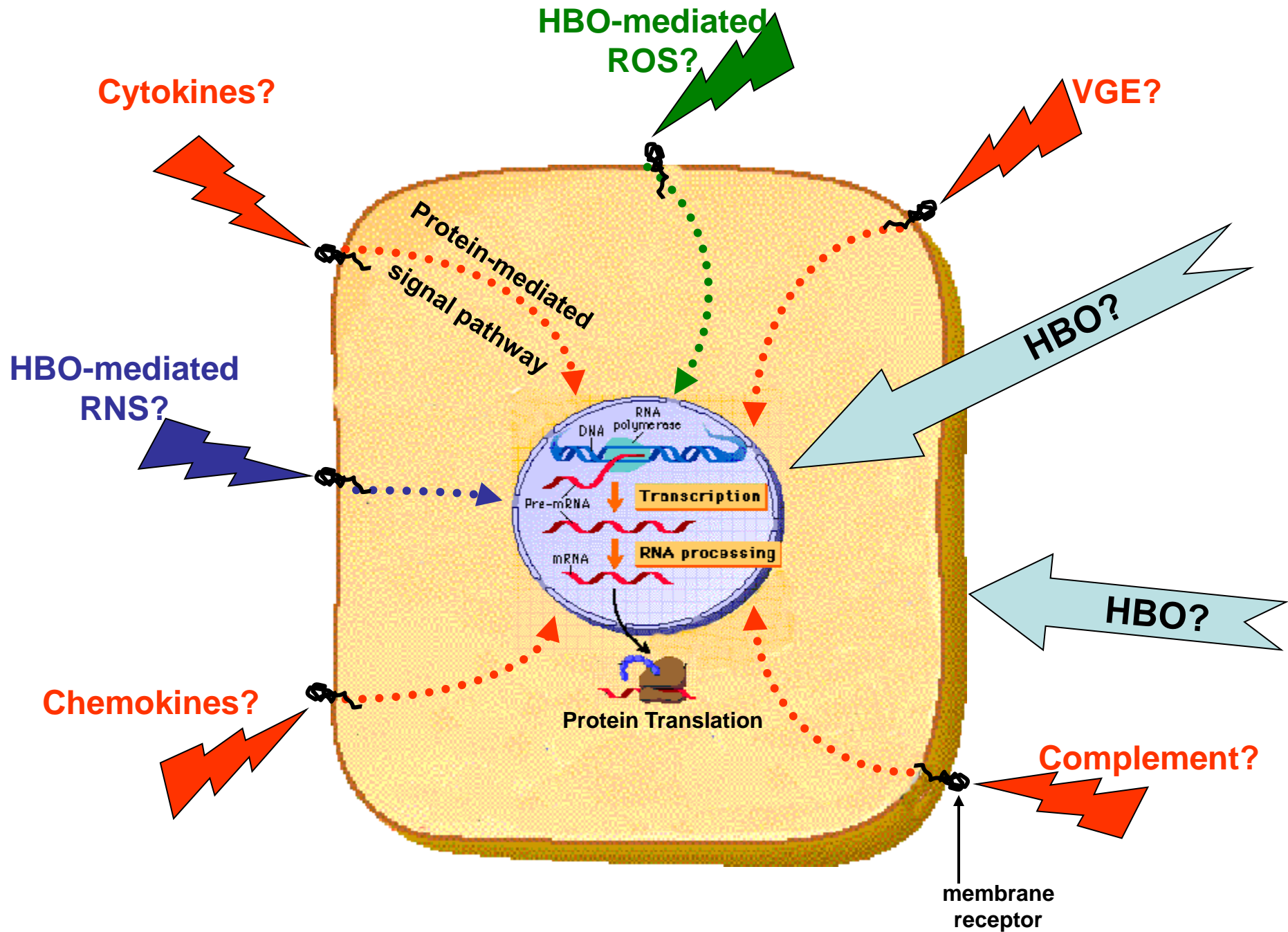


& **the lowest levels of immunoinflammatory response**

Biologically Significant Genes (-2>fold transcription activity>2)







Doppler detection of VGE and PAXgene blood withdrawals

