

Sleeping for Success

Matthew Pava, Ph.D.

Briefing prepared for National Academies Workshop on Exploring Sleep Disturbance in
Central Nervous System Disorders

November 3, 2022



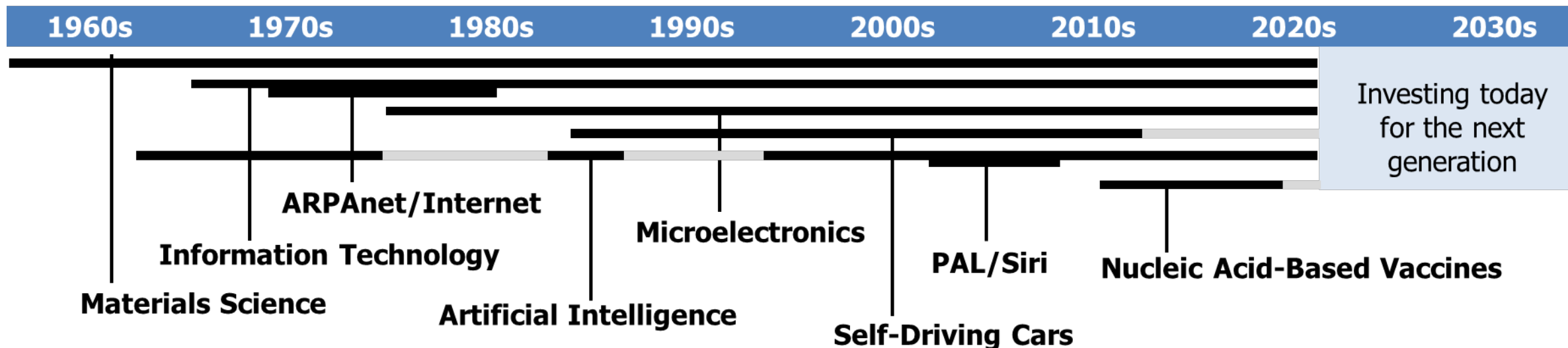


DARPA: History and Purpose



DARPA's Mission:

Prevent and impose technological surprise for the advancement of national security and defense.





Sleep Loss in the Military

TRAINEES



2-5h

sleep
deprivation
each night

WARFIGHTERS



**55-
76%**

Service members
report sleep
deprivation

23%

US Army soldiers
with insomnia

VETERANS



7x

increased
prevalence of sleep
disorders with
combat experience

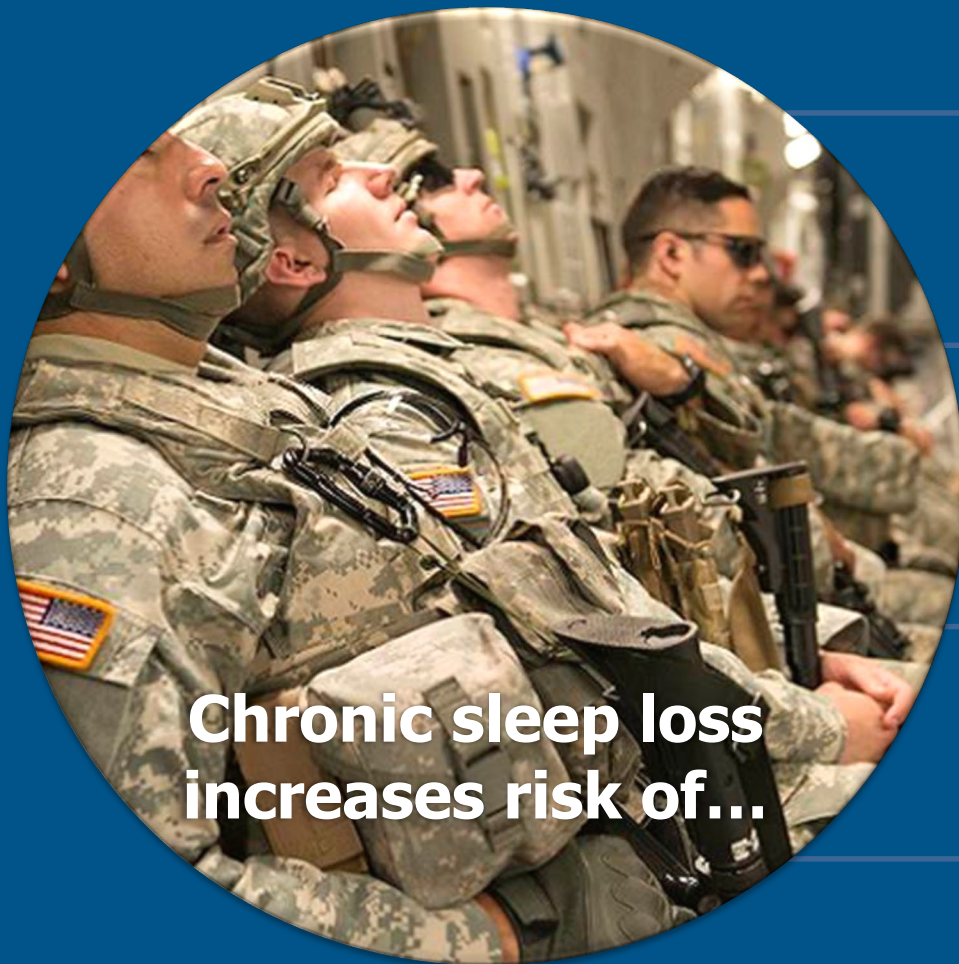
57%

post-9/11 veterans
with insomnia



Why Do We Care?

DELETERIOUS EFFECTS OF CHRONIC SLEEP LOSS ARE SYSTEMIC



**Chronic sleep loss
increases risk of...**



Immune
Dysfunction



Metabolic
Dysfunction

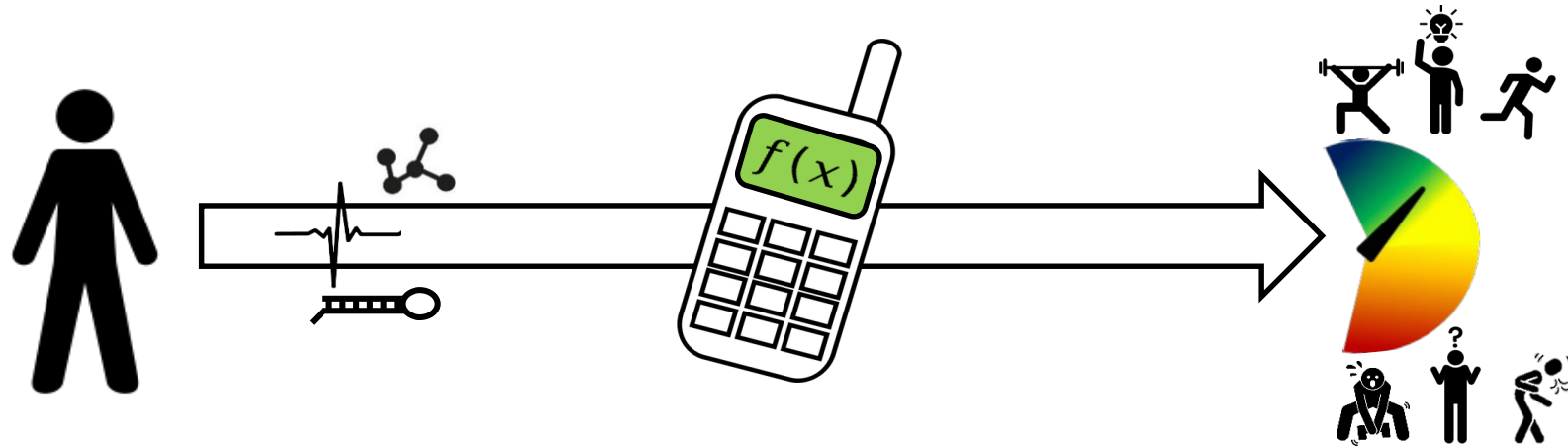


Neuropsychiatric
Dysfunction

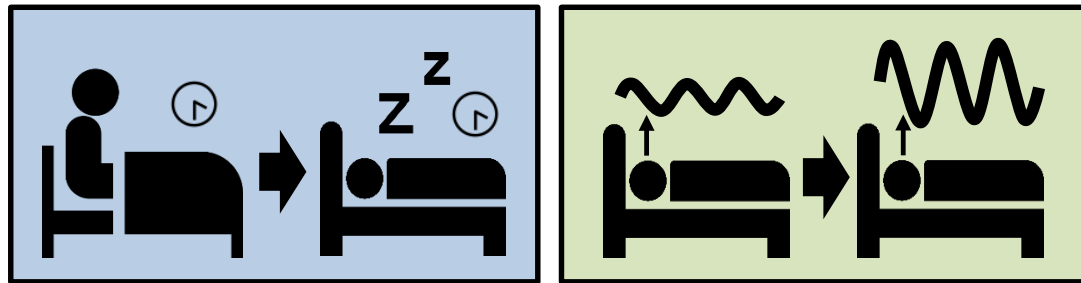


Cognitive &
Memory
Dysfunction

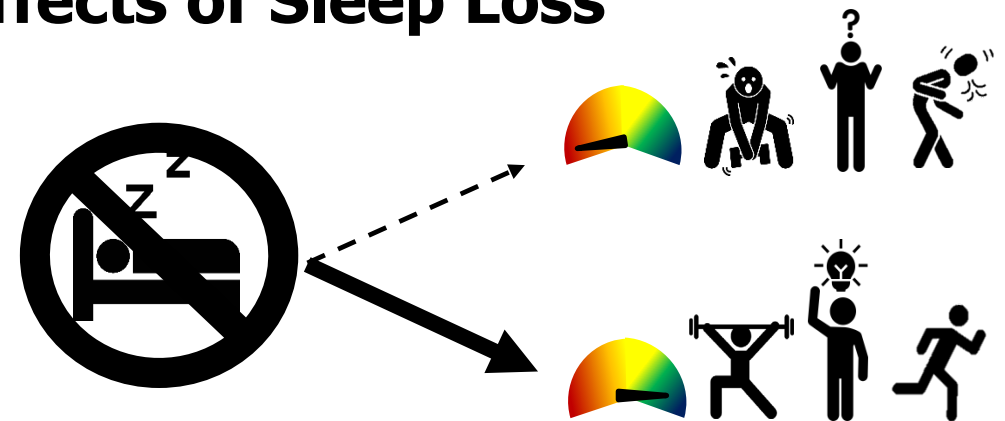
Detect Physiological States of Sleep Drive & Fatigue



Mitigate Deleterious Effects of Sleep Loss



Improve sleep efficacy

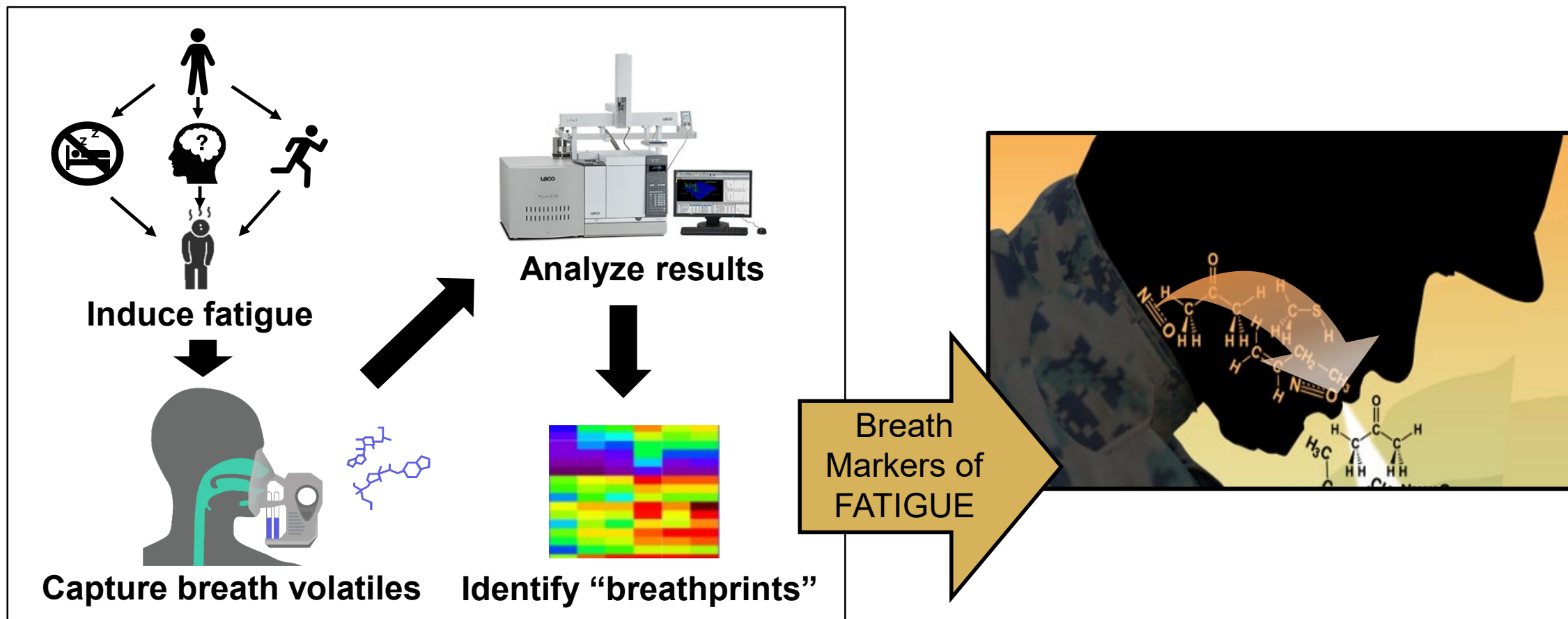


Improve health and performance following sleep loss



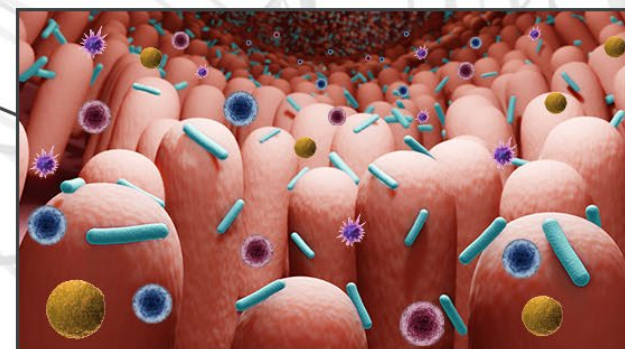
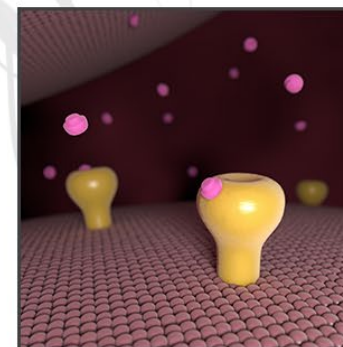
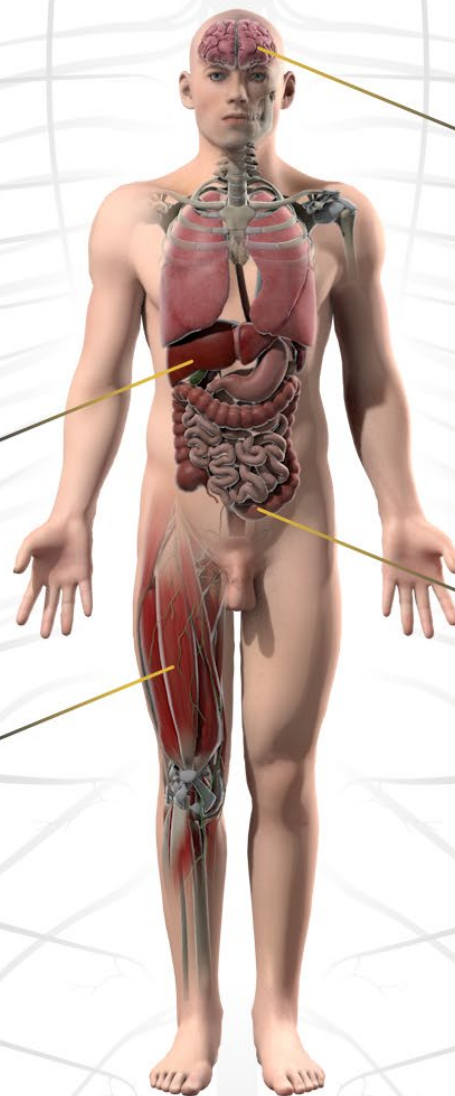
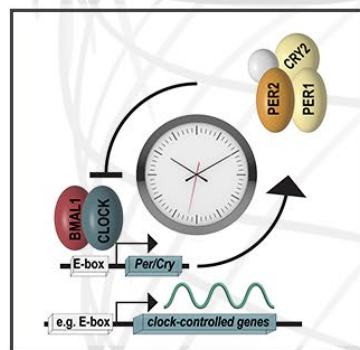
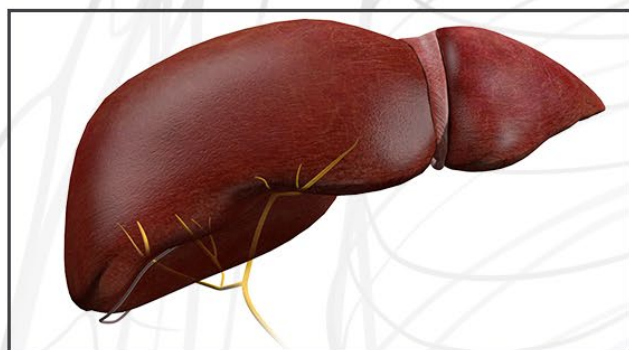
Fatigue Assessment via Breath (FAB)

Reliably quantify fatigue and impairment based on breath signatures





Novel Approaches for Modulating Sleep?





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