

Miles Davis, Herbie Hancock and principles of surgery- understanding the rules of improvisation

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**The Halsted Society**



Surgery: classical training+theory+ experience= improvisation

Emergent properties: nature's way of improvising

In philosophy, systems theory, science, and art, **emergence** occurs when an entity is observed to have properties its parts do not have on their own, properties or behaviors which emerge only when the parts interact in a wider whole.



WIKIPEDIA  
The Free Encyclopedia

# Improvisation occurs at all scales of life and requires bidirectional “chemosignaling”



# Bacteria as Multicellular Organisms

*They differentiate into various cell types and form highly regular colonies that appear to be guided by sophisticated temporal and spatial control systems*

by James A. Shapiro



NATURE | VOL 392 | 12 MARCH 1998

CHEMICAL, SENSES

NEUROREPORT

## Sustained human chemosignal unconsciously alters brain function

Suma Jacob<sup>1</sup>, Leann H. Kinnunen<sup>2,3</sup>, John Metz<sup>3</sup>, Malcolm Cooper<sup>3</sup> and Martha K. McClintock<sup>1,2,CA</sup>

<sup>1</sup>Institute for Mind and Biology, and <sup>2</sup>Department of Psychology, University of Chicago, 5730 South Woodlawn Avenue, Chicago, IL 60637, USA; <sup>3</sup>MICRO, Inc., Chicago, IL, USA

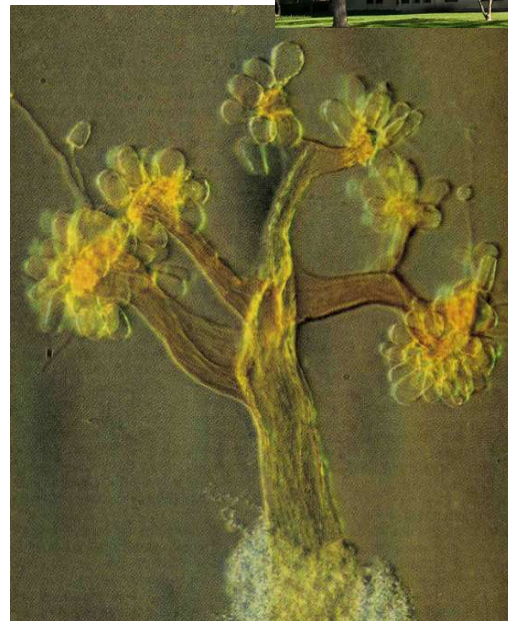


### JAMES A. SHAPIRO

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Gordon Center for Integrative Science



### SCIENTIFIC AMERICAN

OCTOBER 1987  
\$2.50

*The next revolution in computers, the subject of this issue, will see power increase tenfold in 10 years while networks and advanced interfaces transform computing into a universal intellectual utility.*



*Wired Glove gives a computer user the sensation of handling objects on the screen: the image of the hand mimics the user's movements.*



## Regulation of ovulation by human pheromones

Kathleen Stern & Martha K. McClintock

Department of Psychology, The University of Chicago, 5730 Woodlawn Ave, Chicago, Illinois 60637, USA

ARCHIVES | 1995

*SCIENTIST AT WORK: Martha K. McClintock; How Biology Affects Behavior And Vice Versa*

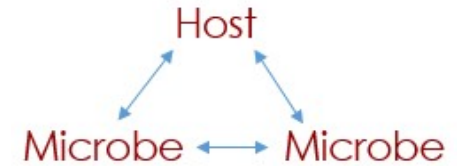
The New York Times

# My research career: understanding how bacteria improvise

Harmony is neither a property of one player or another, rather it is a property of their interaction-

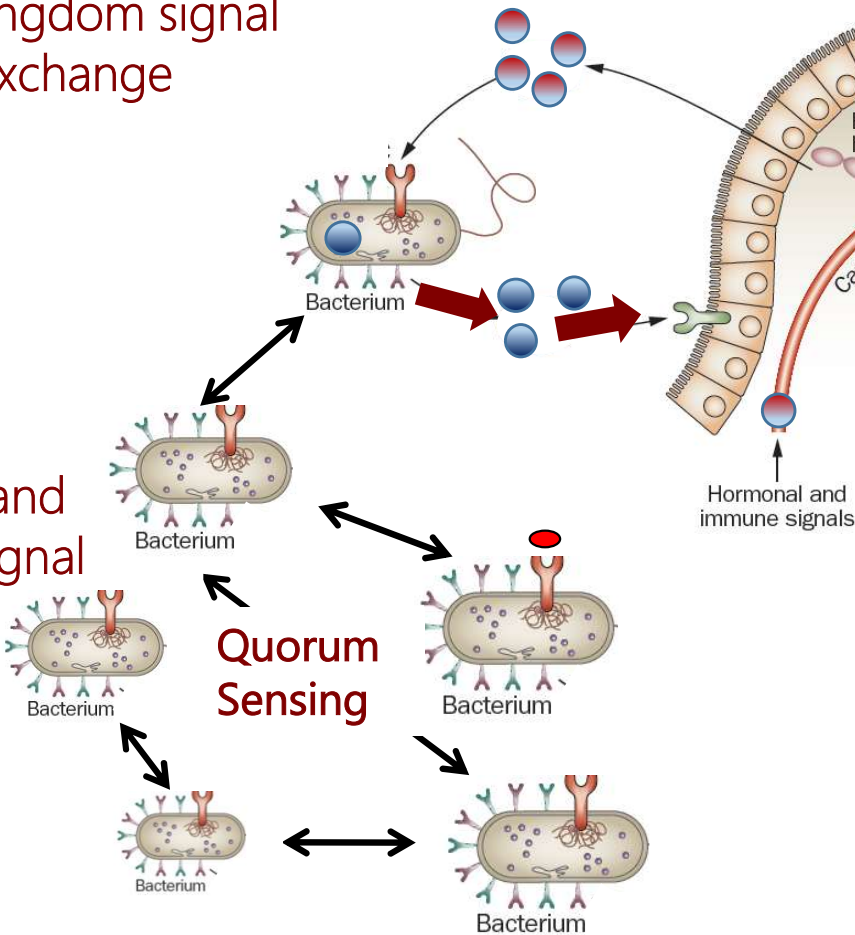


Continuous bidirectional interkingdom signal exchange

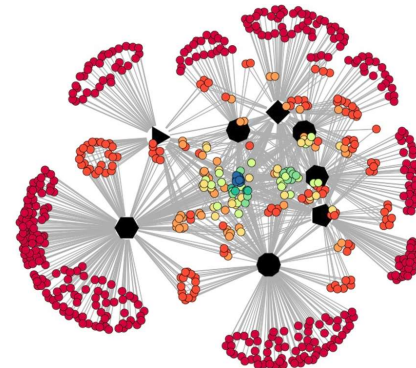


Virulence (harmfulness) is neither a sole property of the pathogen, nor that of the host, but rather a property of their interaction

Interspecies and intraspecies signal exchange



Operative injury releases host-derived bacterial activating "cues"



"a matchless web of dense dynamic interactions"

# Human Tears Contain a Chemosignal

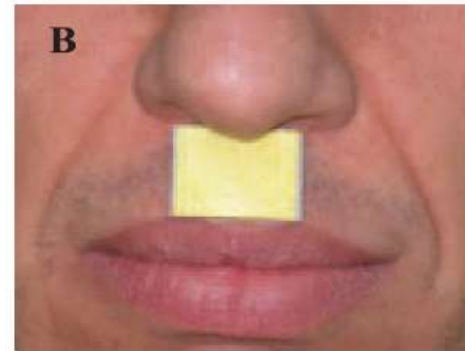
Shani Gelstein,<sup>1\*</sup> Yaara Yeshurun,<sup>1\*</sup> Liron Rozenkrantz,<sup>1</sup> Sagit Shushan,<sup>1,2</sup> Idan Frumin,<sup>1</sup> Yehudah Roth,<sup>2</sup> Noam Sobel<sup>1†</sup>

Emotional tearing is a poorly understood behavior that is considered uniquely human. In mice, tears serve as a chemosignal. We therefore hypothesized that human tears may similarly serve a chemosignaling function. We found that merely sniffing negative-emotion–related odorless tears obtained from women donors induced reductions in sexual appeal attributed by men to pictures of

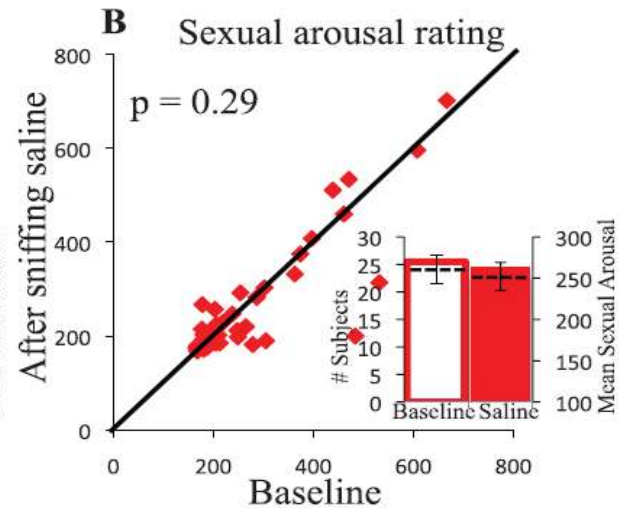
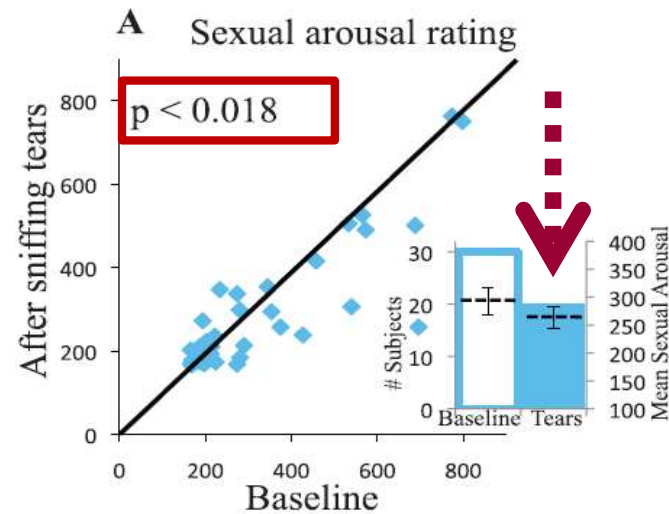
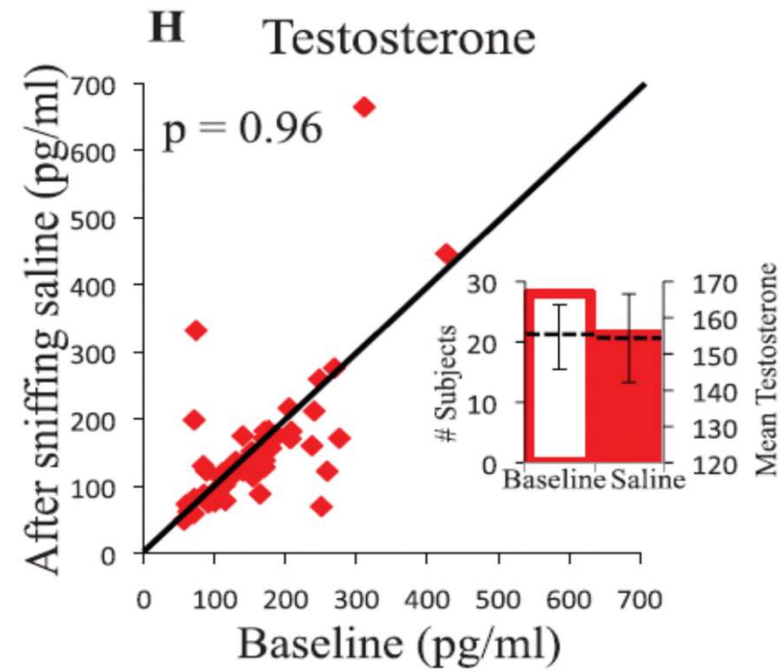
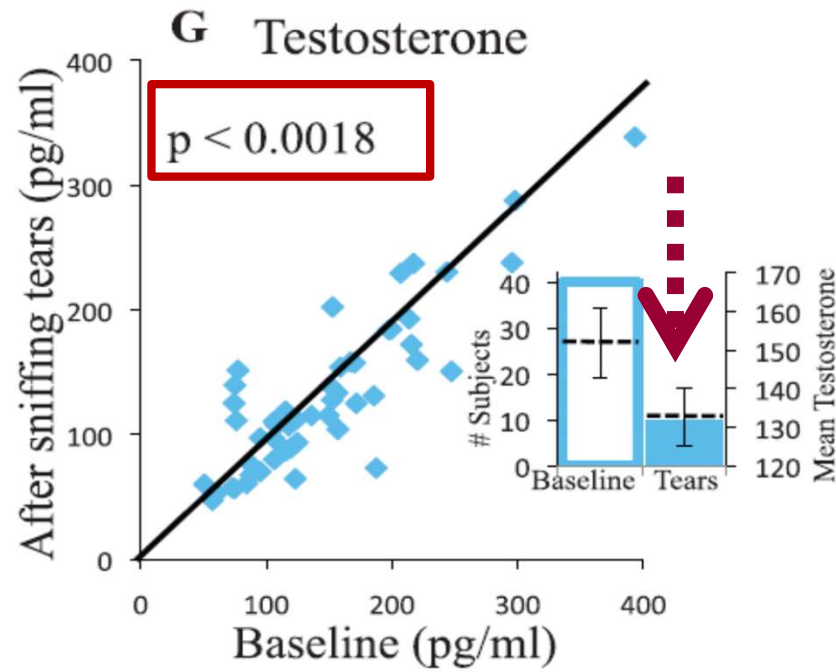
**Collect tears from FEMALES  
watching a sad movie**

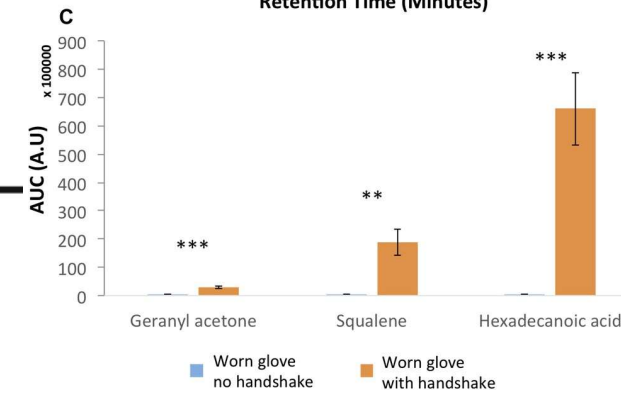
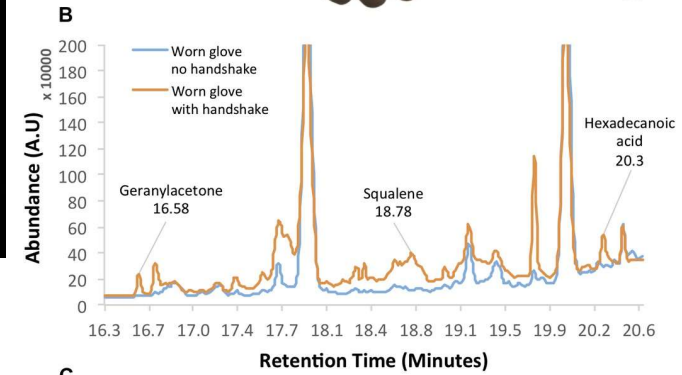
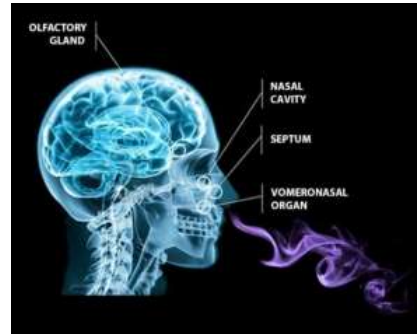


**Expose MALE noses to sad  
tears versus happy tears**



# Unconscious Chemosensing





Journal of Gastrointestinal Surgery  
<https://doi.org/10.1007/s11605-020-04901-2>

INVITED COMMENTARY

# The Benefits of Robotic Surgery: Are They Technical or Molecular?

John C. Alverdy<sup>1</sup>

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# So what's up with the Jazz reference?

1. Jazz is an emergent property
2. Jazz requires chemosensing

Unique sound emerges from "a matchless web of dense dynamic interactions"



# The greatest selling Jazz Album of all time-**Kind of Blue by Miles Davis.** “A matchless web of dense dynamic interactions”

1959



tenor saxophonist-  
John Coltrane



alto saxophonist Julian  
"Cannonball"  
Adderley,



drummer Jimmy Cobb



pianist Bill Evans



bassist Paul Chambers



**NOTE: Classical training + theory + experience=improvisation  
(and....BTW most musicians and most surgeons cannot do it!)**

CHICK COREA  
and  
return to forever  
light as a feather



Chick Corea  
Litha Music  
© 1972

Spain

Handwritten musical score for the piece "Spain" by Chick Corea. The score includes a key signature of one sharp (F#) and a 3/4 time signature. It features several staves of music with various chords and melodic lines. Chords listed include Bm, Em7, F#7, GA, A7, DA, and C#7. The score also includes the instruction "unison w. bass - - - - etc".

Chick Corea and Miles Davis

# “Competence without Comprehension” if you cannot improvise, you cannot operate

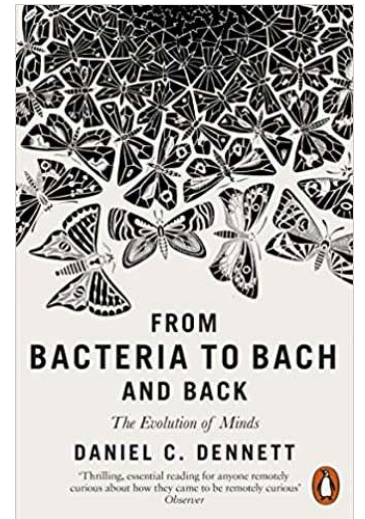


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Caprice Greenberg, MD, MPH, FACS



**It's brand new every time...no two cases are the same**



# Herbie Hancock describes what it means to work in a trusted team



“Music isn’t about competition, but about cooperation and fitting in.”



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**“take whatever situation you have and make something constructive happen with it”**

Thank you Halsted Society



Herbie Hancock & Joni Mitchell