Quando la Musica …Tocca le Cellule

“Sounding out (Cell) Biology A Path to Inward Perception”

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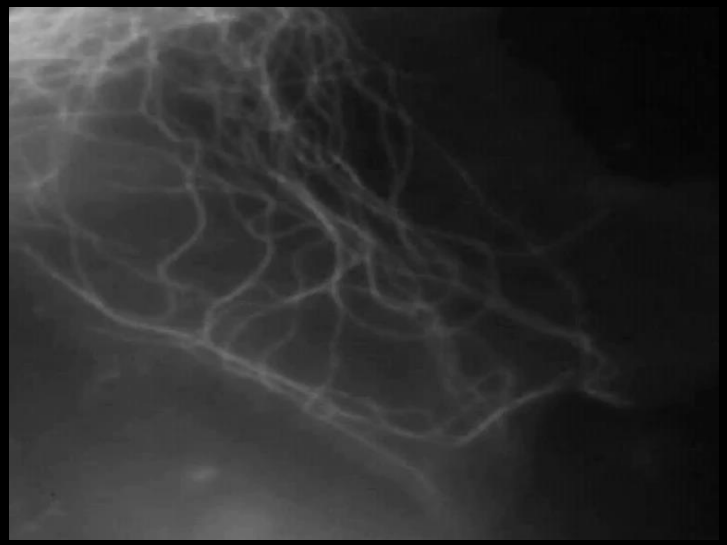
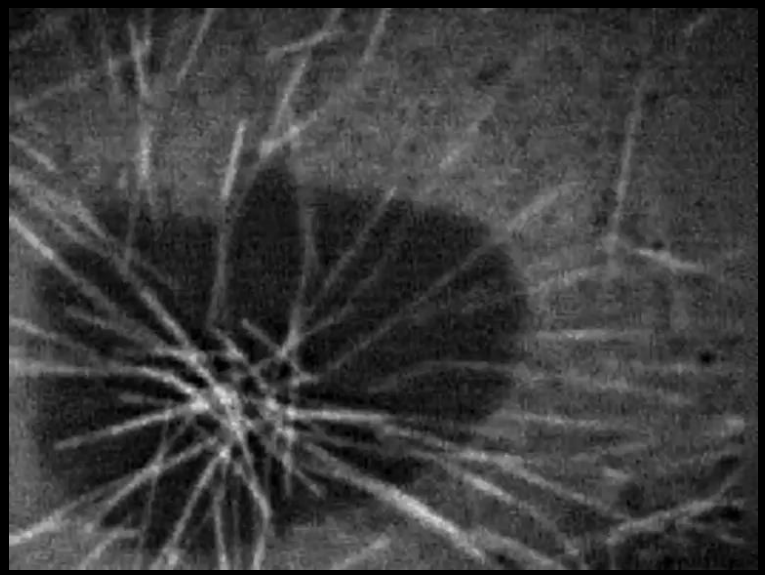
University of Bologna, Italy

CSO Elpis Eremo

INSIDE THE CELL,
A WORLD OF COHERENT VIBRATIONS





SCIENTIFIC REPORTS

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SUBJECT AREAS:
MOLECULAR SELF-ASSEMBLY
BIOMATERIALS - PROTEINS
NANOWIRES

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Live visualizations of single isolated tubulin protein self-assembly via tunneling current: effect of electromagnetic pumping during spontaneous growth of microtubule

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Dielectric resonant images of microtubule

Scanning Tunneling Microscope images of a single microtubule supra-molecule. We pumped ac signal at a particular electromagnetic frequency and imaged tunneling current across the molecule simultaneously. We are providing here how a single microtubule looks like when a particular ac resonance frequency is pumped. Since there are eight frequencies in the central band of total three bands a set of images contain eight primary images. Note that, if water is out of the microtubule core, this image cannot be taken, the microtubule disintegrates as we scan.

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OPEN

Stem cell senescence. Effects of REAC technology on telomerase-independent and telomerase-dependent pathways

SUBJECT AREAS:
REGENERATIVE MEDICINE
AGEING

Received
27 June 2014

S. Rinaldi[1,2,3*], M. Maioli[4,5,6*], G. Pigliaru[4,5], A. Castagna[1,2,3], S. Santaniello[4,5], V. Basoli[4], V. Fontani[1,2,3] & C. Ventura[5,6]

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Neurological morphofunctional differentiation induced by REAC technology in PC12. A neuro protective model for Parkinson's disease

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Margherita Maioli[1,2,3,*], Salvatore Rinaldi[3,4,*], Rossana Migheli[6], Gianfranco Pigliaru[1,2], Gaia Rocchitta[6], Sara Santaniello[1,2], Valentina Basoli[1], Alessandro Castagna[3,4], Vania Fontani[3,4], Carlo Ventura[2,5] & Pier Andrea Serra[6]

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REAC technology and hyaluron synthase 2, an interesting network to slow down stem cell senescence

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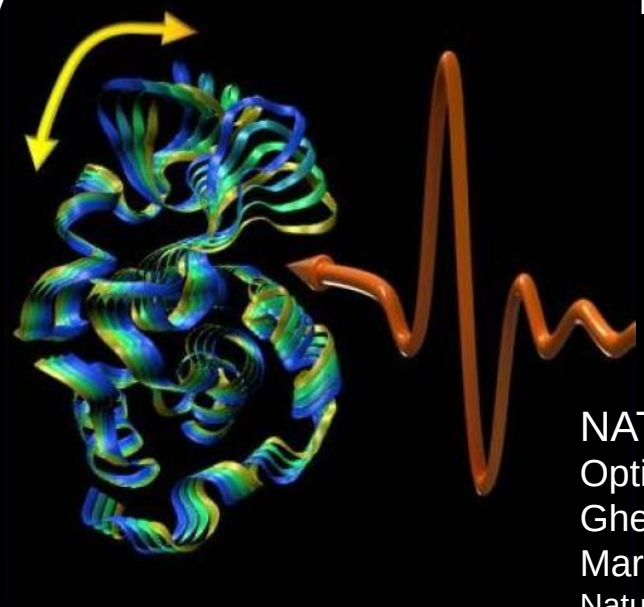
Margherita Maioli[1,2,3,4,*], Salvatore Rinaldi[3,5,6,*], Gianfranco Pigliaru[1,4], Sara Santaniello[1,4], Valentina Basoli[1,6,7], Alessandro Castagna[3,5,6], Vania Fontani[3,5] & Carlo Ventura[4,8]

Ettore Sansavini Health Science Foundation-

Our Signaling Molecules Vibrate with Defined Patterns

Symphony of life, revealed: New imaging technique captures

v ns critical to human life



This graphic visualizes the vibrations in lysozyme as it is excited by terahertz light (depicted by the red wave arrow). Such vibrations, long thought to exist, have never before been described in such detail, said lead researcher Andrea Markelz, (University of Buffalo).

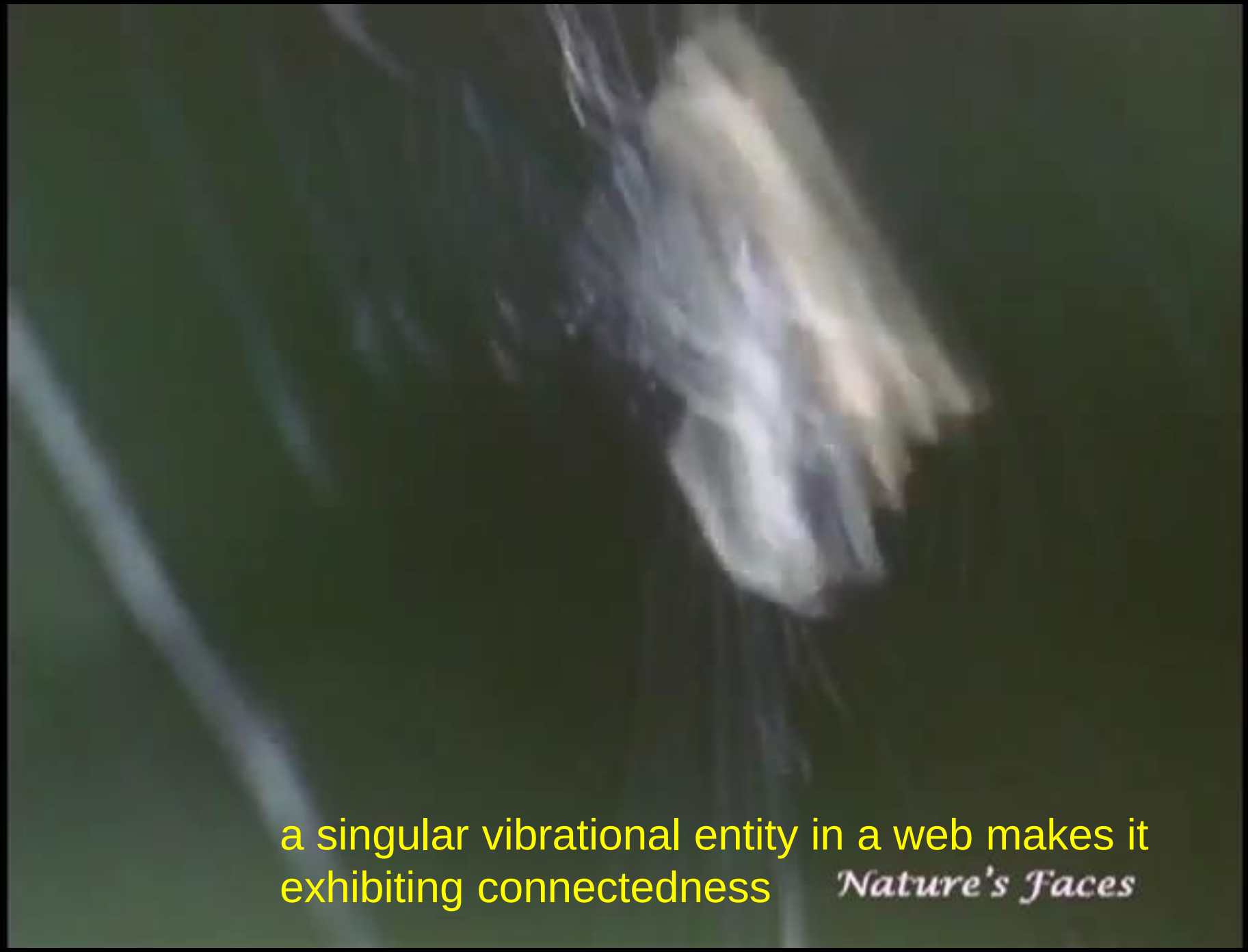
terahertz near-field microscopy

NATURE COMMUNICATIONS | ARTICLE

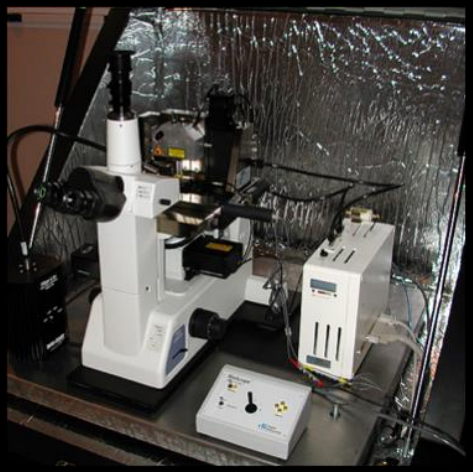
Optical measurements of long-range protein vibrations

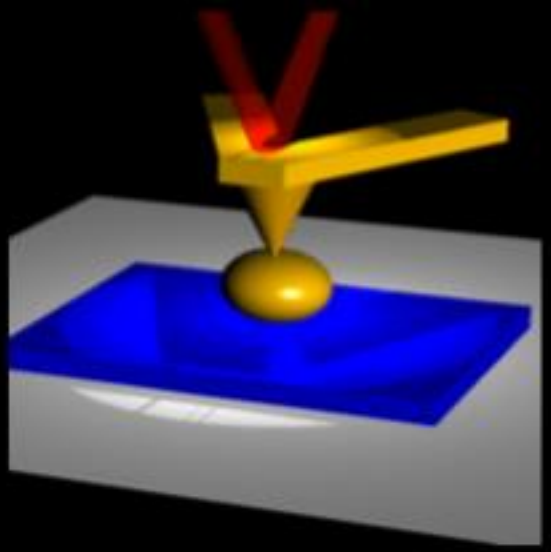
Gheorghe Acbas, Katherine A. Niessen, Edward H. Snell & A.G. Markelz

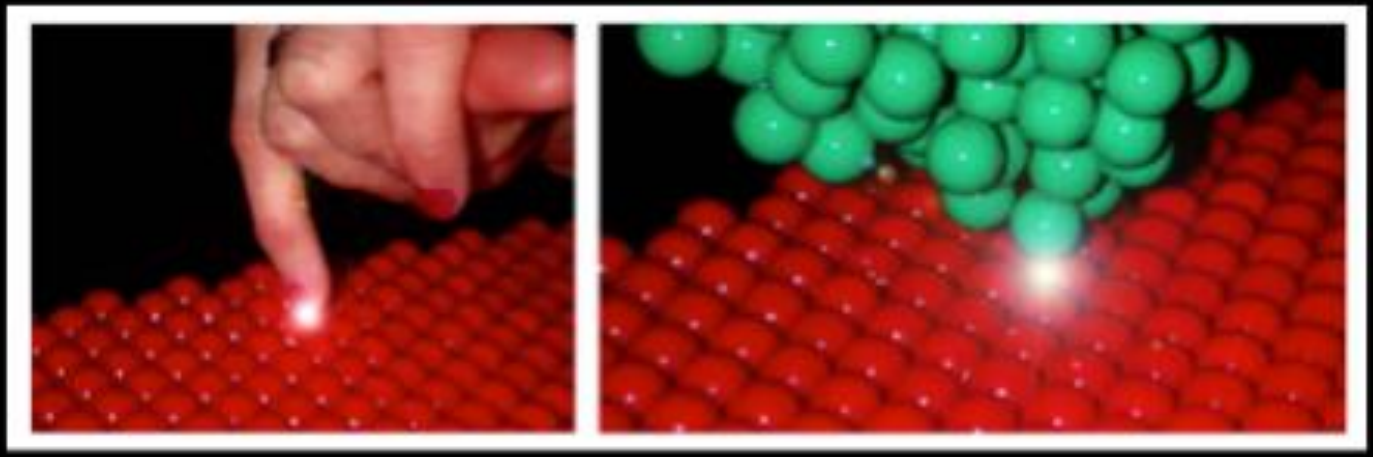
Nature Communications 5, Article number: 3076 doi:10.1038/Published 16 January 2014


a singular vibrational entity in a web makes it exhibiting connectedness
Nature's Faces

The Spider Web: a Complex Adaptive System

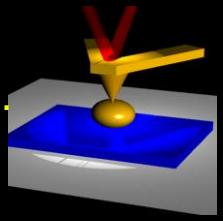






Interrogation of Nanomechanical Signatures During Stem Cell Development ("Nanomechanical characterization of cellular activity - Sonocytology")

Vibrations arise from the integration of various oscillatory rhythms, from nanomechanical properties of subcellular structures up to the cell surface. Oscillatory patterns can be recorded by Atomic Force Microscopy (AFM) and subsequently transformed into audible sounds.



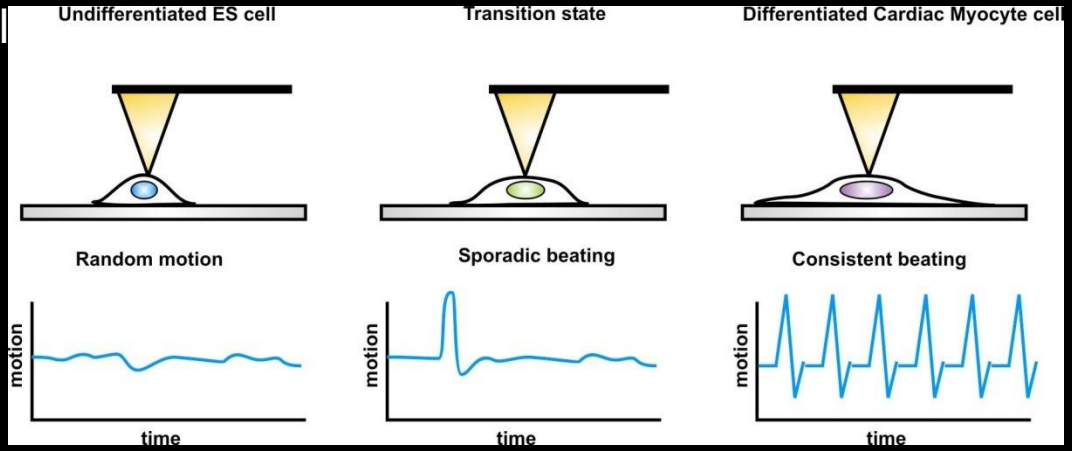
Sound from single yeast cel

22 °C

26 °C

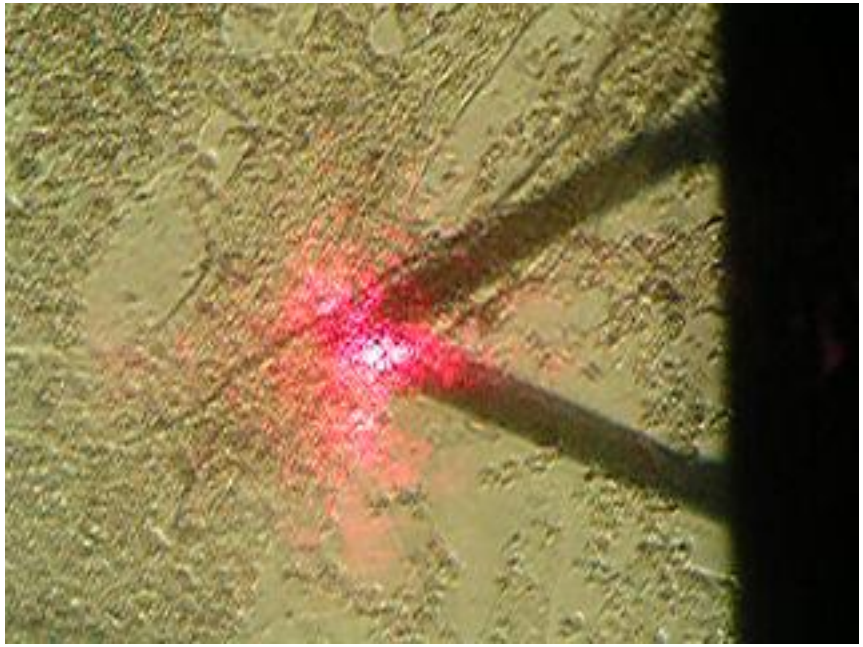
30 °C

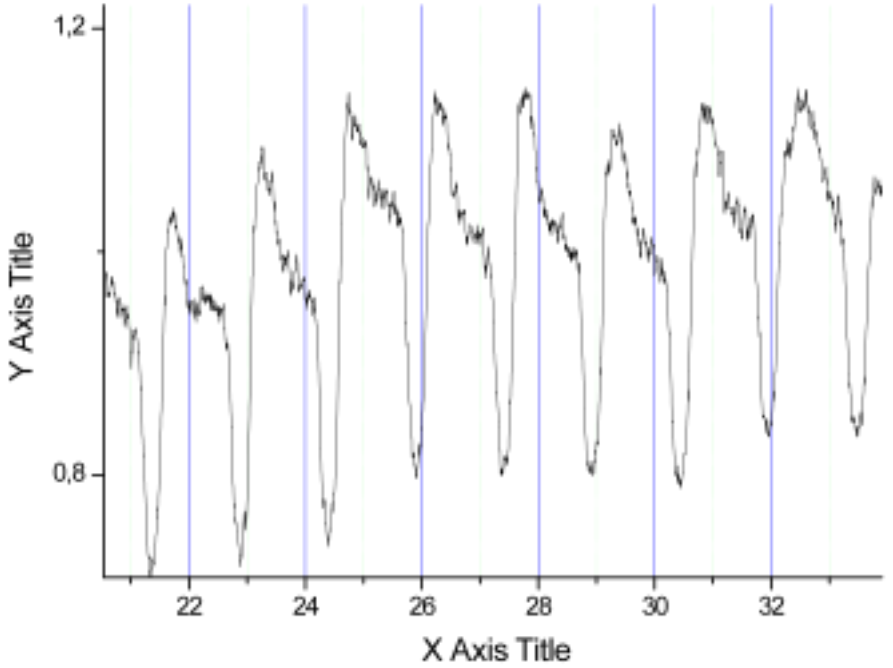
Dead cell



James K. Gimzewski (UCLA) &
Carlo Ventura (GUNA ATTRE - Advanced Therapies and Tissue REgeneration, Innovation Accelerator, CNR, Bologna, Italy)

Re-Creating Cardiac Cells
With The Sound Of Cardiogenesis

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Y Axis Title
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X Axis Title

A New Vision of the cell world and Regenerative Medicine

Reprogramming tissue resident stem cells with no need for stem cell/tissue transplantation, by a : non-invasive, inexpensive, personalized, and easily deliverable on large-scale bases technique.

National Institute of Biostructures and Biosystems (NIBB), Laboratory of Molecular Biology and Stem Cell Engineering - Eldor Lab

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