EFFECT OF RADIOFREQUENCY ELECTROMAGNETIC FIELDS ON IN-VITRO MICROTUBULE SELF-ORGANISATION

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Solutions of reacting chemicals can self-organise

Stationary chemical patterns develop

Example of an *emergent* phenomena in a *complex* system.

Self-organisation can be determined by weak external factors or fields at a critical moment early in the process.

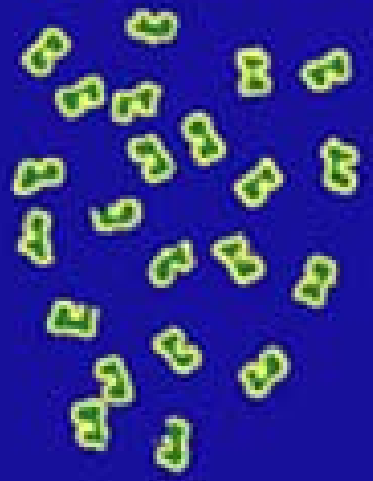
***In vitro* microtubule preparations self-organise by reactive processes.**

Self-organisation triggered by gravity, magnetic fields etc.

Can microtubule self-organisation be triggered by an electromagnetic field ?

TUBULIN

GTP

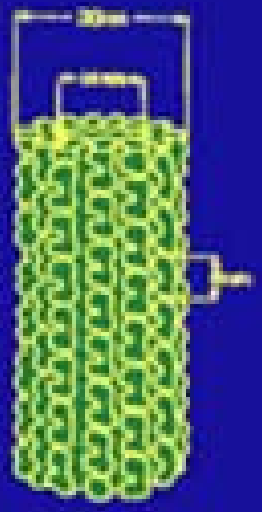


4°C

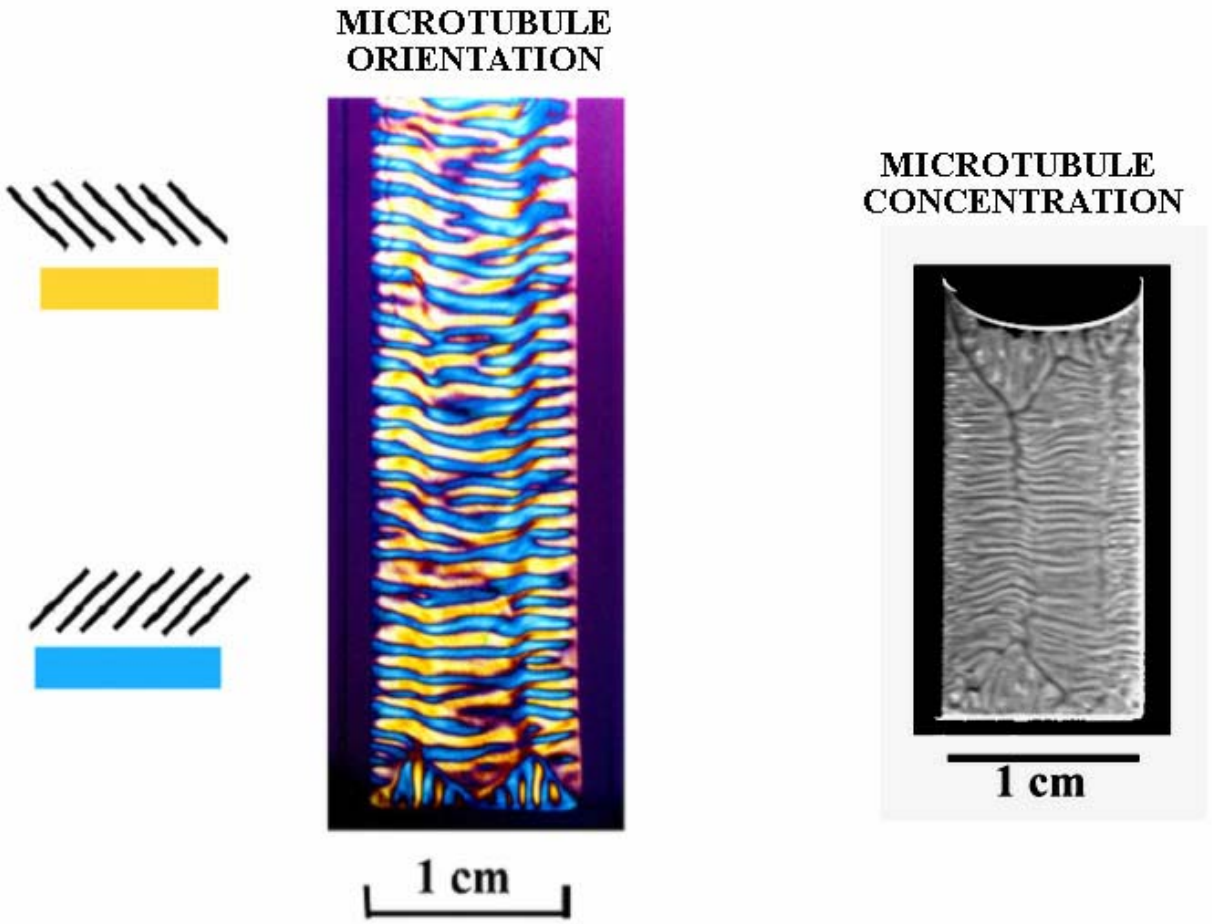
36°C

MICROTUBULES

GDP



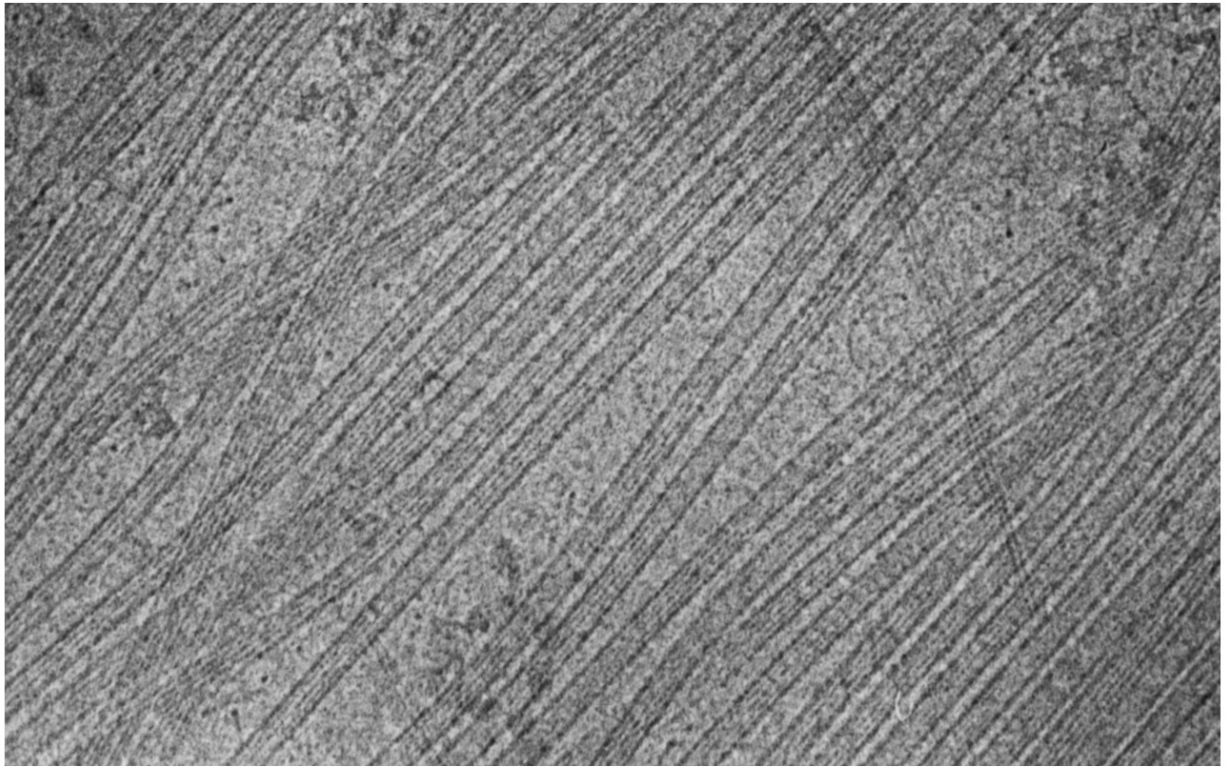
MICROTUBULE PREPARATIONS SELF-ORGANISE



*Nature 346, **6283** (1990)*
*Proc. Nat'l. Acad. Sci. USA **89** 6948 (1992)*
*Science, **264** 245 (1994)*

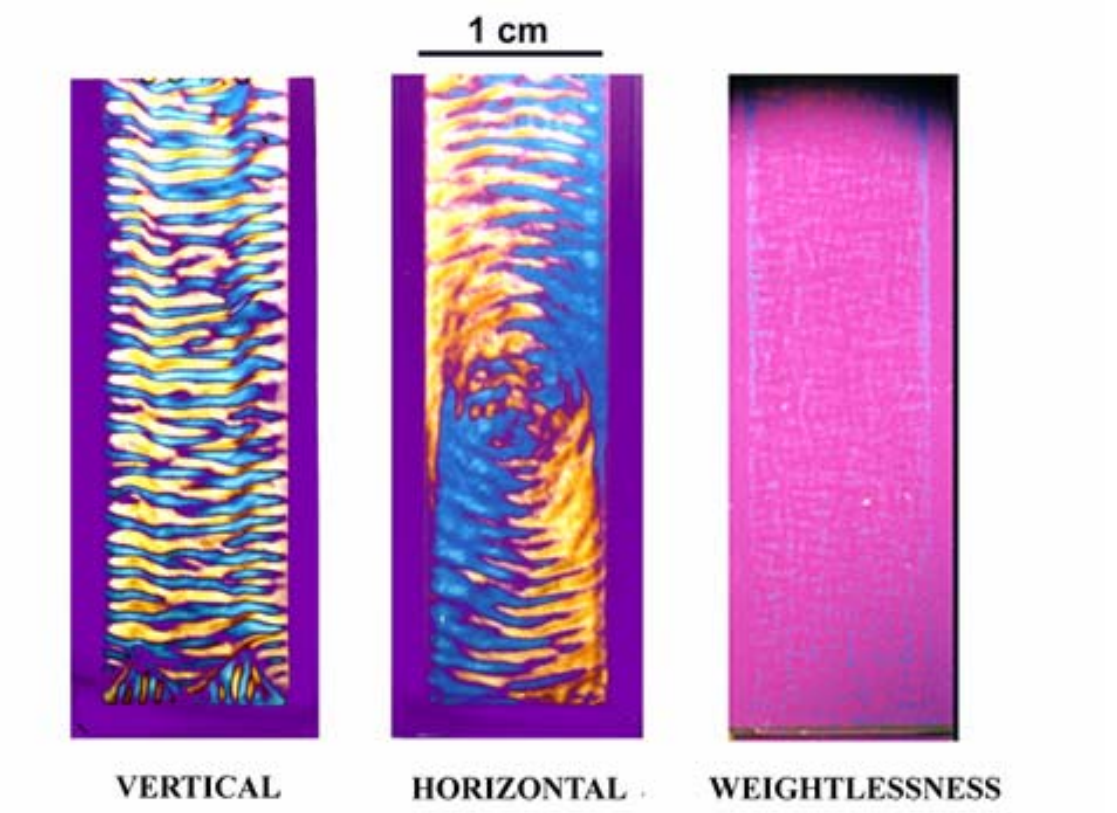
ELECTRON MICROGRAPH

0.2 µm



*Langmuir **18** 7196 (2002)*

SELF-ORGANISATION IS TRIGGERED BY GRAVITY



AFTER 5 HOURS

NORMAL GRAVITY **WEIGHTLESSNESS FOR FIRST 13 MINUTES**

(SPACE EXPERIMENT**)**

*Proc. Nat'l. Acad. Sci. USA **97** 8364 (2000)*

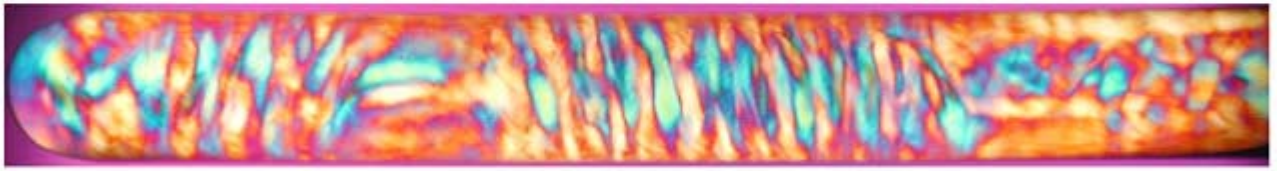
CLINOROTATION REPRODUCES SPACEFLIGHT BEHAVIOUR

Biophysical Chemistry ***121*** *(2006) 1-6*
J. Phys. IV France, ***11*** *255 (2001)*
AGSB Bulletin, ***17*** *13 (2004)*

VIBRATIONS TRIGGER SELF-ORGANISATION
(with N. Glade)

CLINOROTATION (0 g for 15 min)

5 mm



CLINOROTATION + VIBRATIONS (15 min)

125 Hz, 10 µm displacement

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OBJECTIVE

TRIGGER SELF-ORGANISATION UNDER CONDITIONS OF WEIGHTLESNESS OBTAINED IN A CLINOSTAT BY WAY OF AN ELECTROMAGNETIC FIELD.

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