The Evolution of Medicine Toward 4 P Qualities

- P1 Preventive
- P2 Predictive
- P3 Personalized
- P4 Participative
Emergence or reemergence of new epidemics due to:

- Globalization of exchanges and travels
- Demography: concentration in large cities
- Nutrition (pesticides, water)
- Environmental factors
- Climate changes, electromagnetic radiations
- Contacts with wild and farm animals
- Decline of immune defenses
The most important burden
Chronic Diseases

- Cancers
- Cardiovascular
- Neurodegenerative
- Arthritic
- Autoimmune
- Multifactorial, but in common: oxidative stress infectious agents (?)
Various environmental factors effects accumulate

Radiations (γ, X, UV, visible)

Air chemical pollution

Food

Intensive physical exercize

tobacco smoke

alcohol

ischemia

Viral infections

Bacterial infections

= DISEASE
Our microbial ecosystem:

- Mucosa
- Skin

Constant exposure to microbial agents and immune protection
Extreme genetic plasticity of microorganisms:

- virus: HIV, Influenza
- Bacteria
- Parasites

against reaction of the immune system
How bacteria have learned how to persist despite the immune system

- Biofilms
- Mobile antibiotic resistant genes
- Nanoforms
- Nanostructures
Persistent cold infections

- Inability of the immune system to eradicate them (tolerance, oxidative stress)
- Non-multiplicative forms of « classical » bacteria
- Intracellular bacteria
- Sanctuaries (bone marrow, joints, intestine, brain, ....)
- Vectors (Parasites)
- Remote effects (toxin, nanostructures)

Antibiotics affect them only when they go out of sanctuaries
EXPLORING THE ROLE OF LATENT INFECTION IN CHRONIC DISEASES
A physical and molecular approach
A new technology for detecting bacteria and viral DNA's

Based on the production of electromagnetic waves
A newly discovered property of DNA:

Resonance emission of low frequency electromagnetic waves by high water dilutions of DNA.
Capture of the signals

Sample

Sensor coil

X 500

Amplifier

Signal Analysis software

Computer

Sample
Filtration

2ng/1ml

10^{-2} \quad 10^{-3} \quad 10^{-4} \quad 10^{-5} \quad 10^{-6} \quad 10^{-7} \quad 10^{-8} \quad 10^{-9} \quad 10^{-10} \quad 10^{-11} \quad 10^{-12} \quad 10^{-13} \quad 10^{-14} \quad 10^{-15} \quad 10^{-16}

7-100 Hz

1000 - 3000 Hz
Average of power of positive dilutions

Average of power of negative dilutions

\[ \times 100 \]
Patient: 14

Imuniti + ARV
Viral DNA from Plasma

Puissance du signal (dB/Hz)

M0
M1
M2
M3

NF D2 D3 D4 D5 D6 D7 D8 D9 D10
Spectral Frequency Analysis

Fourier Transformation

A positive signal is defined by:

✓ amplitude increase
✓ Shift to higher frequencies (500-2000 Hertz)
Noise

(+) Frequency (1-20000 Hertz)

Time (sec)

Frequency (1-20000 Hertz)
### Micro-organisms involved in EMS induction

**1. DNA from main pathogenic bacteria**
- Streptococcus
- Staphylococcus
- Pseudomonas
- Mycoplasma pirum
- Salmonella
- Clostridium
- Proteus mirabilis
- B. Subtilis
- Borrelia burgdorferi

**- From viruses**
- HIV1
- Influenza group A
- HBV
- HCV

**- Genes involved**
- M.pirum adhesin
- HIV genes
I – DNA’s emit EMS
II – EMS are produced by water nanostructures (naneons)
III – EMS are producing naneons
IV – Naneons and EMS carry specific DNA information
II.a – EMS are produced by water nanostructures (naneons)

Evidence:

- from filtration
  - Size: between 20 and 100 nM for bacterial sequences
  - Smaller than 20 µM for viral sequences
- from biophysical studies
  - Indicating spectrometral changes in the dilutions producing EMS
IV – Naneons and EMS carry specific DNA information

Natural and digital transmission
Classical model of PCR
PCR on water nanostructures
DNA

-2  -3  -4  -5  -6

Tube 1

-2  -3  -4  -5  -6

water

18hrs

EMS

Generator 7Hz

-6 water

Tube 2

μmetal
D-4 LTR HIV DNA (104bp) 7Hz, 18 Hrs and then PCR (35 cycles) from D-2 to D-15 after filtration 450 and 20 nM

Transmission in water of D-4 LTR HIV DNA (104bp) 7Hz, 18 Hrs and then PCR (35 cycles) from D-2 to D-15 after filtration 450 and 20 nM

DW: Distilled Water / FD2: Dilution 10-2 after filtration 450 and 20 nM
Water-mediated photonic transmission of DNA

DNA → Water Naneons

EMS → Computer Digitized

Receiver EMS → Analog → PCR → DNA

Water Naneons
Reproduction of DNA transduction in other laboratories

File EMS of 194 bp DNA from HIV1 LTR
Sent to Benevento University,
Molecular Biology Laboratory
DNA reproduced and sequenced
100 % identical to original

File EMS of 499 bp DNA from Borrelia burgdorferi
Sent to Laboratory of Chronix Biomedical
University of Gottingen
W : pure water
IWNF: informed water, not filtered
IWFND: informed water, filtered, not diluted
D1-D9: informed water, filtered, diluted
Water-mediated photonic transmission of DNA

Gel electrophoresis of the PCR DNA product (Borrelia Burgdorferi)
E. Schutz et al. Goettingen, 2011
How pathogenic information can persist, and escape immune defence and treatment.
Medical applications

Plasma of patients: on DNA (also any other fluid and tissues)
- Colibacillus
- Mycoplasma (Ureaplasma)
- Borrelia

But also diseases not known to be of infectious origin.
- Neurodegenerative: Alzheimer (18/18)
- Parkinson
- Multiple sclerosis
- Various neuropathies
- Chronic Lyme syndrome
- Autism (some)
- Rhumatoid arthritis (50/50)
- Cancers ?

The objective is clear: to identify the bacterium(a) involved: may come from the gut
Persistent cold infections

- Inability of the immune system to eradicate them (tolerance, oxidative stress)
- Non-multiplicative forms of « classical » bacteria
- Intracellular bacteria
- Sanctuaries (bone marrow, joints, intestine, brain, ....)
- Vectors (Parasites)
- Remote effects (toxin, nanostructures)

Antibiotics affect bacteria only when they go out of sanctuaries
Autism: The infectious track

Luc Montagnier and the Chronimed team
The application of eye-tracking technology in the study of autism

Zillah Boraston1 and Sarah-Jayne Blakemore1,2

1Behavioural and Brain Sciences Unit, Institute of Child Health, University College London, London WC1N 1EH, UK
2Institute of Cognitive Neuroscience, University College London, 17 Queen Square, London WC1N 3AR, UK

For many decades, eye-tracking has been used to investigate gaze behavior in the normal population. Recent studies have extended its use to individuals with disorders on the autism spectrum. Such studies typically focus on the processing of socially salient stimuli. In this review, we discuss the potential for this technique to reveal the strategies adopted by individuals with high-functioning autism when processing social information. Studies suggest that eye-tracking techniques have the potential to offer insight into the downstream difficulties in everyday social interaction which such individuals experience.
Study on 97 children

- 73 diagnosed autisms
- 10 autistic spectrum disorders
- 4 Dravet syndromes
- 2 Rett syndromes
- 3 Asperger syndromes
- 3 cases with Epilepsy and/or mental retardation
- 2 Tourette syndromes

88% of children between the age of 2 and 12
(youngest 15 months old, oldest 29 years old)
Treatment Protocol

• Antibiotherapy (macrolides) [Beware of the Herxheimer reaction]
  + Antifungal treatment (Triflucan)
  + Antiparasites (Fluvermal then Flagyl)
  + Correction of deficiencies

• Antioxidants and Immuno-stimulants

• Food supplements

• Casein-free and gluten-free diets
• Best if children younger (before 7: 71% of rapid improvement)

• But even a slow improvement in an older child is still viewed very positively!
# Results versus age

## Very good results

### ≤ 7 years old
- 32 (71%)

### > 7 years old
- 9 (32%)

## Slower improvement

### ≤ 7 years old
- 6 (13%)

### > 7 years old
- 13 (46%)

## Insufficient improvements

### ≤ 7 years old
- 3 (7%)

### > 7 years old
- 5 (18%)

## Treatment Interrupted

### ≤ 7 years old
- 4 (9%)

### > 7 years old
- 1 (4%)

---

### ≤ 7 years old
- Très bons résultats
- Améliorations plus lentes
- Améliorations insuffisantes
- Arrêt Traitement

### > 7 years old
- 80%
- 70%
- 60%
- 50%
- 40%
- 30%
- 20%
- 10%
- 0%
Correlation between EMS, antibiotic treatment and clinical signs in an autistic child

- AZITHROMYCIN
- CEFUROXIM

Accept various food
More present with Family members
Starts speaking
Placebo effect?... Chance?...

Better mother-child relationship??!!

Effect of educational methods?

In case of discontinuation of the antibiotherapy, or too long pause

Somatic AND behavioral symptoms reappear...

and re-disappear in 48 hours after the restoration of antibiotherapy.
Environmental factors
- genetic susceptibility

Oxidative stress

Immunosuppression

Bacterial agents

\[ \rightarrow \text{Oxidative stress} \]

Somatic mutations

« prion » effect

Reversible

Less and less reversible
Correlation EMS/disease

One example

Patient female, suffering from chronic Lyme disease for 10 years. First search for EMS in her plasma was negative.

However on July 2007, she had an outbreak of arthritic crisis on both knees.

At the same time, EMS were detected in her plasma DNA.
Multiple Sclerosis
(Multifactorial origin, autoimmunity)

BUT

In Many but not all cases:
presence of EMS in the plasma DNA of bacterial origin.

Example: female patient

1st Symptoms in February, 2011
Measure of EMS 3 months later:++
Antibiotic treatment (doxycycline)
Symptoms cleared, EMS decreased
Already after 1st month
The special case of HIV

HIV RNA $\rightarrow$ no EMS
HIV DNA $\rightarrow$ EMS

Integrated
Non integrated

Appears after tritherapy
**HIV-1**

### Regulatory proteins:
- **TAT**: Trans-activator of HIV promoter
- **REV**: Nuclear export of late, unspliced RNA to the cytoplasm

### Accessory proteins:
- **VPR**: induces G2 cell cycle arrest and nuclear import of the preintegration complex
- **NEF**: Down-regulation of cell surface CD4 and MHC1. Enhances virion infectivity
- **VIF**: virion infectivity factor
- **VPU**: enhancement of virion release and CD4 degradation by targeting to the proteasome
HIV1<sub>LAI</sub> 5' LTR amplicons generated by PCR

HIV-1<sub>LAI</sub> 5' LTR

1. U3 start

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<th>250</th>
<th>355</th>
<th>412</th>
<th>445</th>
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<th>NF&lt;sub&gt;K&lt;/sub&gt;β-I</th>
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<th>Sp1-III</th>
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<th>TATA Box</th>
<th>TAR</th>
<th>poly-A signal</th>
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U5 end 633

Length of Amplicons

300 bp
195 bp
138 bp
105 bp
A.R.T.

- Reverse transcriptase nucleosidic inhibitors

  Ex: AZT, 3TC, etc

- Reverse transcriptase non nucleosidic inhibitors

  Ex: nevirapine, efavirenz

- Protease inhibitors

  Ex: nelfinavir, ritonavir
The only solution is a short term treatment (6-9 months) which will achieve a cure: **Functional eradication of HIV infection.**
Objective

Self-control of HIV infection by the patient’s own immune system:

- No disease will occur
- The patient will have lower ability to transmit the virus
How?

• To restore the immunity against HIV (antioxidants, therapeutic vaccine)

• To identify and target the viral reservoir.
Preliminary Clinical Trial

Patients at time zero were all on ARVs for at least one year and were divided in three arms:

Arm 1: ARVs stopped for one month then put back on ARVs

Arm 2: ARVs + Imuniti

Arm 3: ARVs only (continued)

and followed every month for three months
This HIV DNA may reflect a shift to a DNA-DNA replication mechanism, and represent at least part of the HIV reservoir remaining under ART.
<table>
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<tr>
<th>ARM</th>
<th>ID</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
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**Patient: 14**

**Imuniti + ARV**

Viral DNA from Plasma

<table>
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<th>EMS (%) over noise</th>
<th>M0</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>38.7</td>
<td>29.9</td>
<td>16.4</td>
<td>38.8</td>
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</table>

ND: Not Determined
\[
\frac{\text{Average of power of positive dilutions}}{\text{Average of power of negative dilutions}} \times 100
\]
Patient: 14

Imuniti + ARV
Viral DNA from Plasma

Puissance du signal (dB/Hz)

NF D2 D3 D4 D5 D6 D7 D8 D9 D10

M0 M1 M2 M3
Patient: 14

Imuniti + ARV
Bacteria DNA from Plasma

Puissance du signal (dB/Hz)

M0
M1
M2
M3

NF D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15
HIV treatment tomorrow?

Infection

Time

Year

ARVs

DNA

RNA
RISK FACTORS OF HIV INFECTION

HIV plasma RBC

Risk factor 2 RBC

Risk factor 1 RBC

DNA

PCR

+ (LTR 195 bp) (all HIV)

+ (213/237 bp) (all HIV+, a few HIV-)

EMS

+ (20 nM) (HIV+)

+ (100 nM) (HIV+)

- (HIV- & HIV+) (100 nM)
The latter result is a very encouraging step towards eradication of viral infection by suppressing the viral reservoir.
Application to Diagnostic And Monitoring of Therapies

• Blood safety

• Prevention of nosocomial diseases

• Detection of microbial agents in chronic diseases
  • Neurodegenerative diseases and psychiatric
  • Arthritis
  • Cardiovascular
  • Cancer

• Biomarker of HIV reservoir which remains after tritherapy
World Foundation of AIDS Research and Prevention
R. Olivier, Cl. Lavallee, H. Chenal, M. Mbamy,

Nanectis Biotechnologies SA
J. Aissa, Cl. Lavallee, R. Olivier

Goettingen University and Chronix Biomedical
E. Schutz, H. Urnovitz

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