



Epigenetic Research **Gelsemium sempervirens**

PhD Etienne Capieaux



Biological evidence for an effect of high homeopathic potencies using **biomolecular tools**

*Etienne CAPIEAUX
Ir PhD*



DYNHOM 13 mai 2017

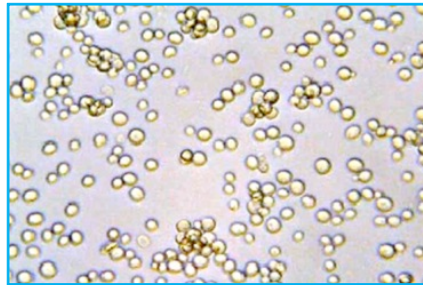
Gelsemium

L'homéopathie est reliée à la vie

**Impacts de médications
homéopathiques
sur des organismes vivants**

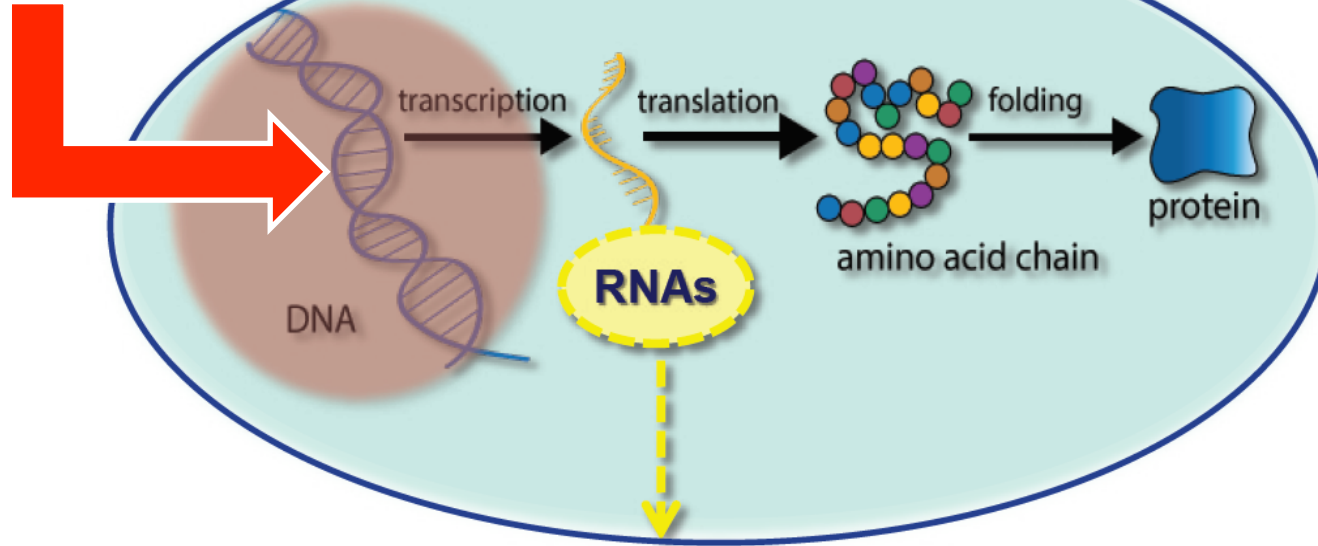
Impacts de médicaments homéopathiques **sur** des organismes **vivants**

High Homeopathic Potencies



→ Biological activities

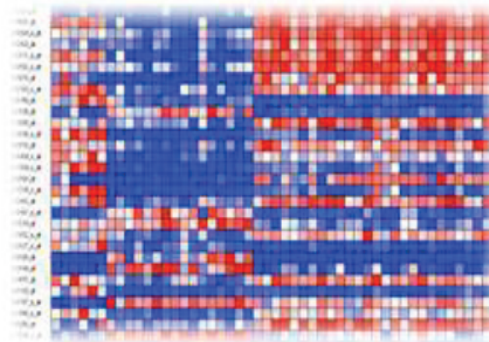
**Impacts
environnementaux**



**Conséquences
phénotypiques**



Expression génique



Facteurs environnementaux



Alimentation

Hygiène de vie

Climat émotionnel

Climat hormonal

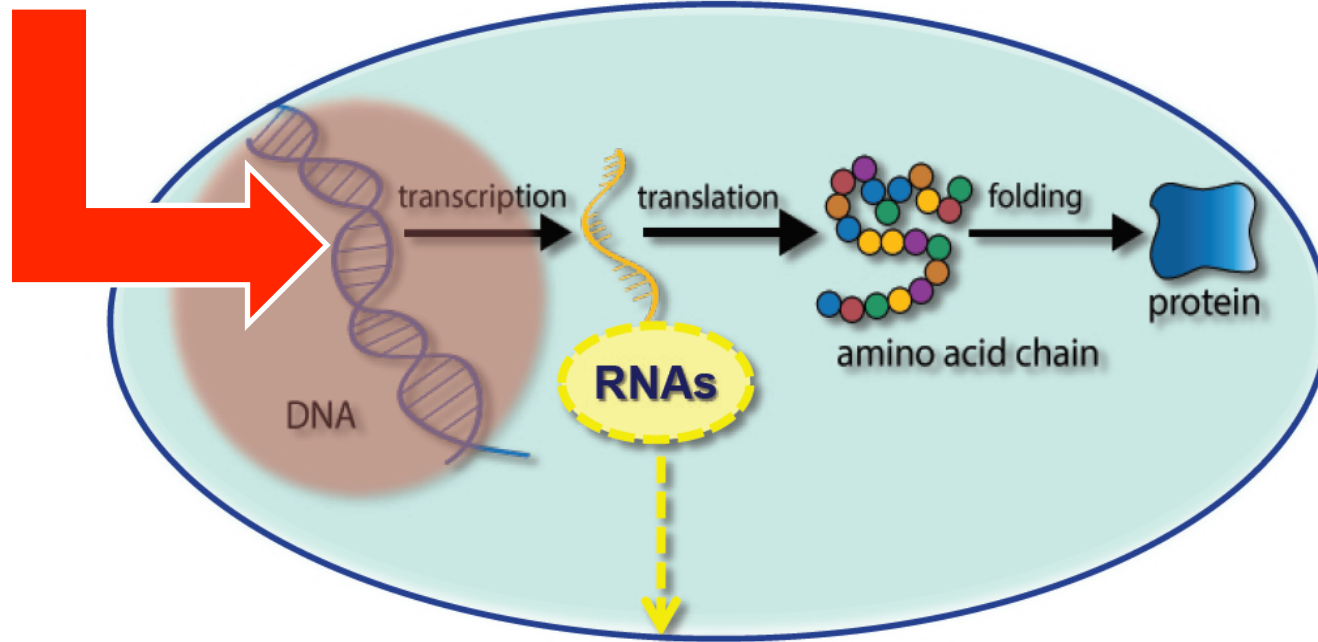
Médicaments allopathiques

Médicaments **informationnels**

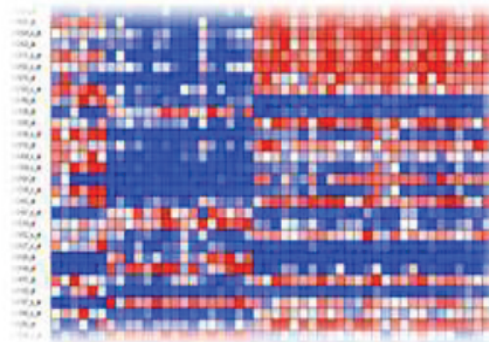


Médicament homéopathique

Conséquences
phénotypiques



Expression génique



*Vu par les techniques de la biologie moléculaire,
toutes les évidences expérimentales vont dans le même sens*

- **Un message homéopathique impacte sur l'expression d'un gène**
- **L'impacte au niveau de la transcription**
- **On est dans une régulation de type "Epigénétique"**

Publications récentes

Expression génique & Médications homéopathiques

Test compound	Potencies	Cell type	Effect	REF.
<i>Carcinosinum</i>	MT, 30C, 200C	DLA cells	↑ specific gene expression (p53 pro-apoptotic)	(Sunila et al. 2009)
<i>Arsenicum alb.</i>	30C	Saccharomyces cerevisiae, E. coli	↑ Resistance to arsenicum toxicity ↓↑ expression of specific genes (apoptotic, stress response proteins)	(Das et al. 2011; De et al. 2012 of Khuda-B.group)
<i>Carcinosinum, Hydrastis, Ruta or Thuja</i>	200C	DLA cells	↑ Apoptosis , ↓↑ Gene expression (whole genome analysis)	(Preethi et al. 2012)
<i>Gelsemium s.</i>	2C, 3C, 5C, 9C, 30C	Human neurocytes SHSY5Y	7 genes ↑ 49 genes ↓ expression (whole genome analysis) ↓ gene expression (RT-Array, 2C)	(Marzotto et al. 2014; Olioso et al. 2014)
<i>Apis mellifica</i>	3C, 5C, 7C	Human prostate RWPE-1	↑↓ expression of different groups of genes (whole genome analysis)	(Bigagli et al. 2014)
<i>Rhus tox.</i>	30X	Primary cultured mouse chondrocytes	↑ specific gene expression (COX-2), ↓ specific gene expression (collagen II; de-differentiation role)	(Huh et al. 2013)
<i>Arsenicum alb.</i>	45X	Arsenic-intoxicated wheat seeds	↑ Germination ↓ Gene expression levels	(Marotti et al. 2014)
<i>Condurango</i>	30C	H460-non-small-cell lung cancer cells	↓↑ expression of specific genes (apoptotic), ↑ Apoptosis, oxidative stress, mitochondrial depolarization	(Sikdar et al. 2014)
<i>Arnica m.</i>	2C, 3C, 5C, 9C, 15C	THP-1	↓ expression of inflammatory genes ↑ expression chemokine genes	(Olioso et al. in preparation)

***Vu par les techniques de la biologie moléculaire,
toutes les évidences expérimentales vont dans le même sens***

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Inactivation des gènes par modifications épigénétiques

Gènes

Types de **cancers** associés

Cycle cellulaire

Rb	<i>Inhibition de la transcription</i>	Rétinoblastome, gliome , cancer du colon
P16 INK4A	<i>Inhibiteur des CDK 4 et 6</i>	Leucémie, lymphome , cancers de la peau et du poumon
P15 INK4B	<i>Inhibiteur des CDK 4 et 6</i>	Leucémie, lymphome

Intégrité du génome

P53	<i>Transcription de gènes (cycle et apoptose) et réparation de l'ADN</i>	Cancers du poumon , de la prostate
BRCA	<i>Régulation de la transcription et réparation de l'ADN</i>	Cancers du sein et de l' ovaire
hMLH1	<i>Réparation de l'ADN</i>	Cancers gastrique , du colon et de l' ovaire

Réponse aux facteurs de croissance

PTEN	<i>Inhibition de la voie de la PI3-K</i>	Glioblastome , cancers gastrique , du sein et de la thyroïde
ER	<i>Contrôle de la prolifération</i>	Cancers du sein et de la prostate

MEDECINE/SCIENCES 2005 ; 21 : 405-11 :

Modifications épigénétiques et cancer Sophie Deltour, Valérie Chopin, Dominique Leprince

Faisons un zoom sur

Ruta Graveolens

200CH

Efficacité de médicaments homéopathiques

Ruta graveolens 200CH

Integrative Cancer Therapies

<http://ict.sagepub.com/>

**Induction of Apoptosis of Tumor Cells by
Some Potentiated Homeopathic Drugs:
Implications on Mechanism of Action**

Korengath Preethi, PhD¹, Sunila Ellanghiyil, PhD¹,
Girija Kuttan, PhD¹, and Ramadasan Kuttan, PhD¹

"in vitro"

Lignées humaines

DLA (Lymphome)

Puce à 15.000 gènes

Conclusions

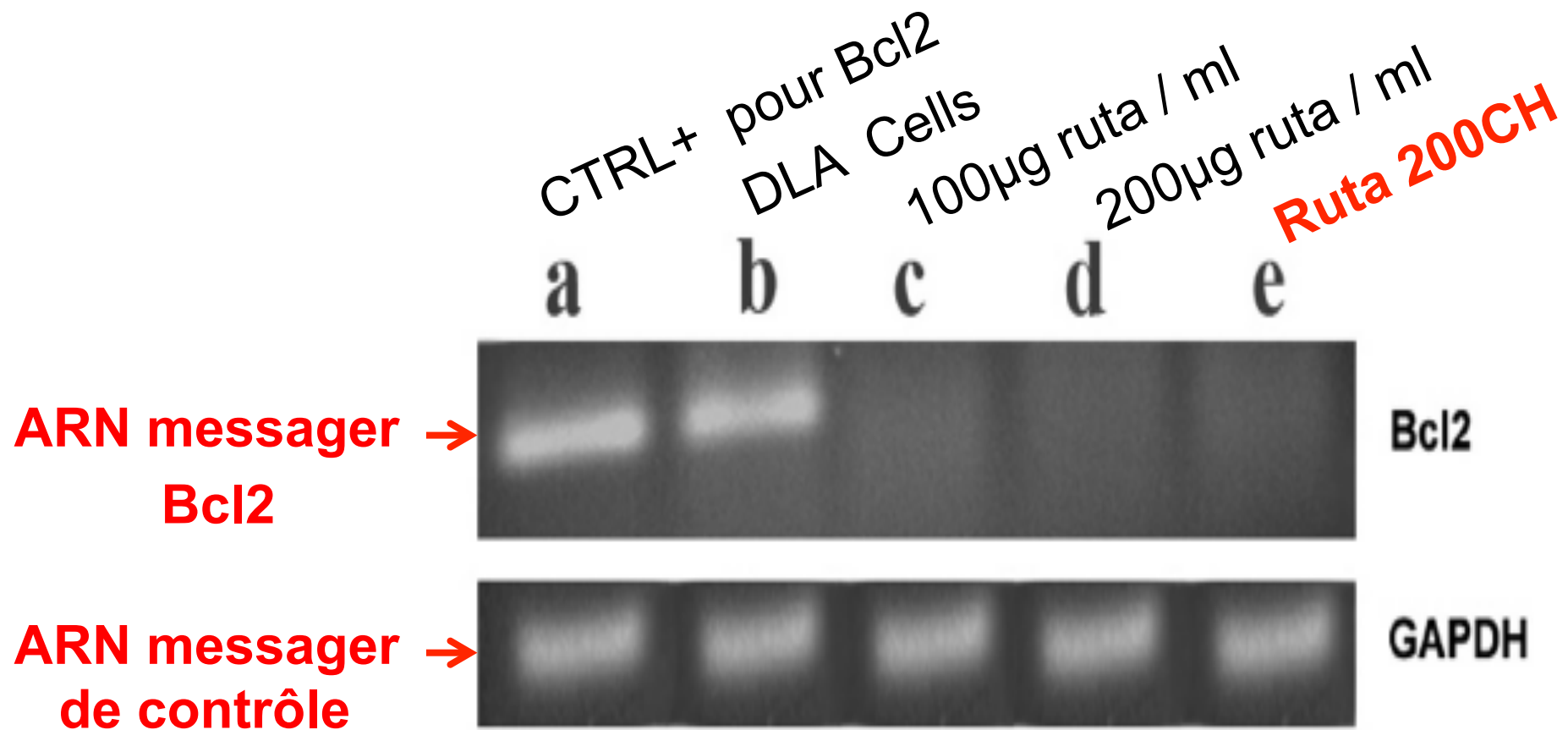
Ruta graveolens 200CH

Impact sur l'expression génique de gènes
impliqués dans

l'**apoptose** (*upregulation*)

l'**oncogénèse** (*downregulation*)





re 3. Gene expression of p53 and bcl2 after treatment with

Results

Effect of *R. graveolens* and Ruta 200C on the Induction of Apoptosis

Morphology and DNA laddering. Results indicated that *R. graveolens* as well as Ruta 200C induced apoptosis, as seen by the morphological features of the treated DLA cells.

DLA Cells
100µg ruta / ml
200µg ruta / ml
Ruta 200CH

Integrative Cancer Therapies 11(2)

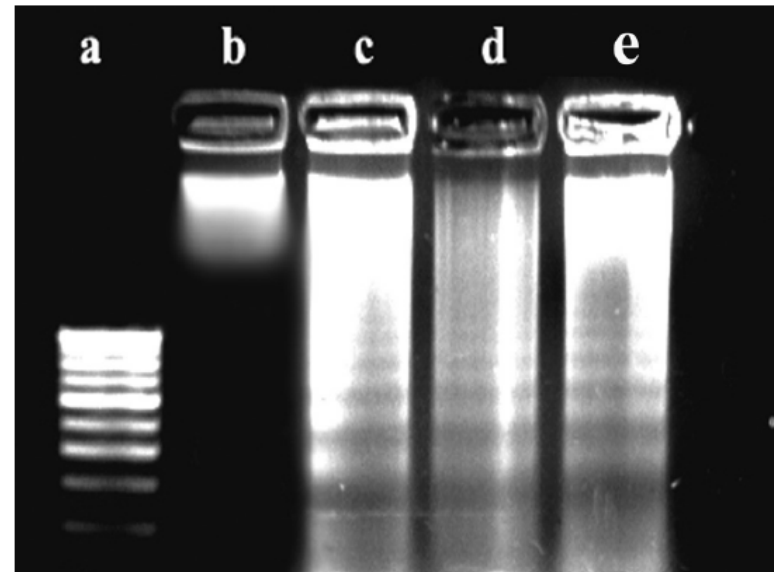


Figure 2. DNA laddering after treatment with *Ruta graveolens* and Ruta 200C (in vitro): lane a, molecular weight marker (100 bp); lane b, untreated control; lane c, treated with *R. graveolens* (100 µg/mL); lane d, treated with *R. graveolens* (200 µg/mL); lane e, Treated with Ruta 200C (20 µL/mL)

Results

Effect of *R. graveolens* and Ruta 200C on the Induction of Apoptosis

Dalton's lymphoma ascite (DLA)

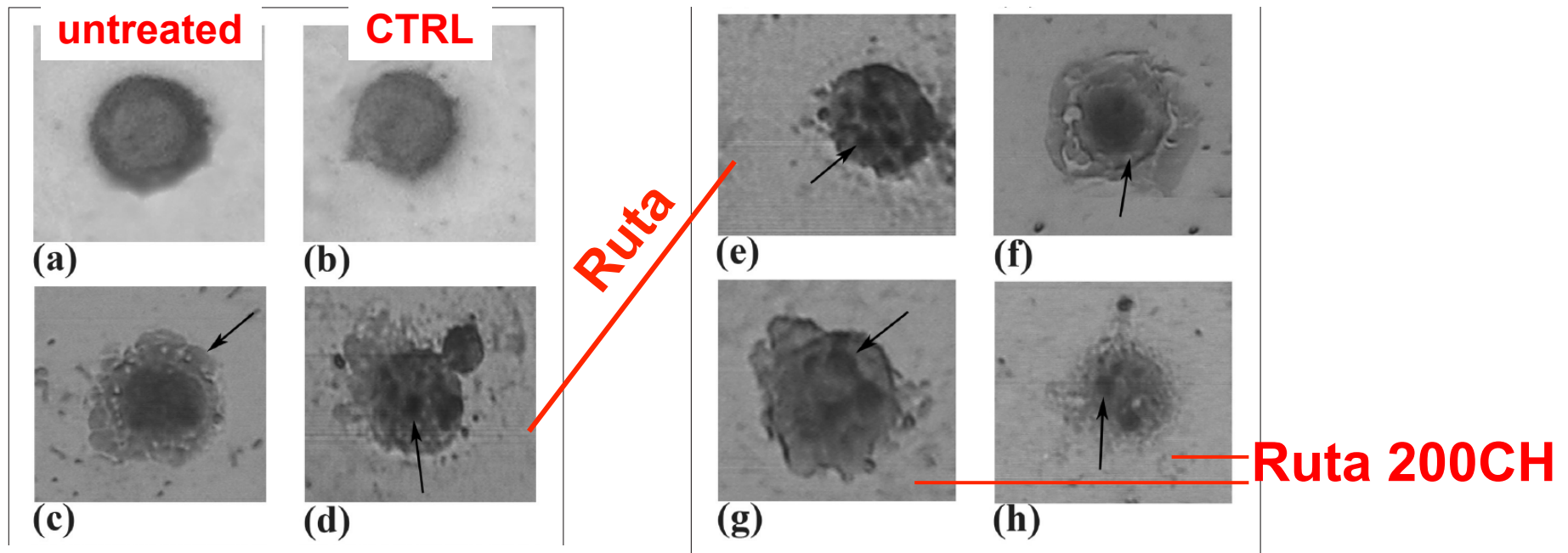


Figure 1. Morphology of Dalton's lymphoma ascite (DLA) cells after treatment with *Ruta graveolens* and Ruta 200C (in vitro) (400×): A. untreated DLA cells; B. vehicle control (1% alcohol); C. cell treated with *R. graveolens* showing blebbing; D, E. cell treated with *R. graveolens* showing apoptotic bodies; F. cell treated with Ruta 200C showing chromatin condensation; G, H. cell treated with Ruta 200C showing apoptotic bodies

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GELSEMIUM

(*Gelsemium sempervirens* L.)

Marzotto et al. *BMC Complementary and Alternative Medicine* 2014, **14**:104
<http://www.biomedcentral.com/1472-6882/14/104>



RESEARCH ARTICLE

Open Access

Extreme sensitivity of gene expression in human SH-SY5Y neurocytes to ultra-low doses of *Gelsemium sempervirens*

Marta Marzotto¹, Debora Olioso¹, Maurizio Brizzi², Paola Tononi³, Mirco Cristofolletti¹ and Paolo Bellavite^{1*}



GELSEMIUM

(Gelsemium sempervirens L.)

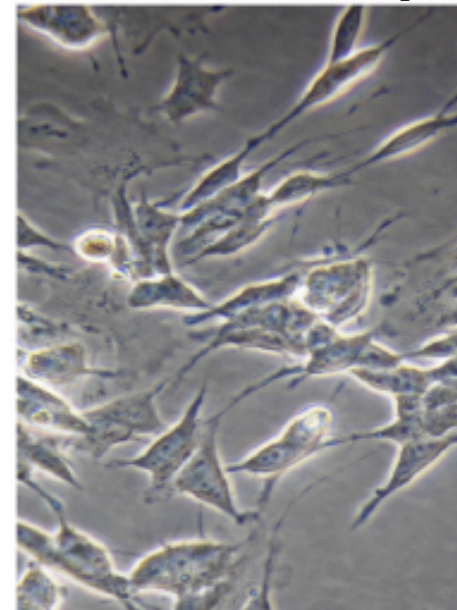


OP racine



2 – 3 – 4 – 5 – 9 – 30 CH

"in vitro"
Lignées humaines
Neurocytes
Puce à 45.033 spots



SH-SY5Y - IMR-32

GELSEMIUM

56 gènes → Expression Génique modifiée

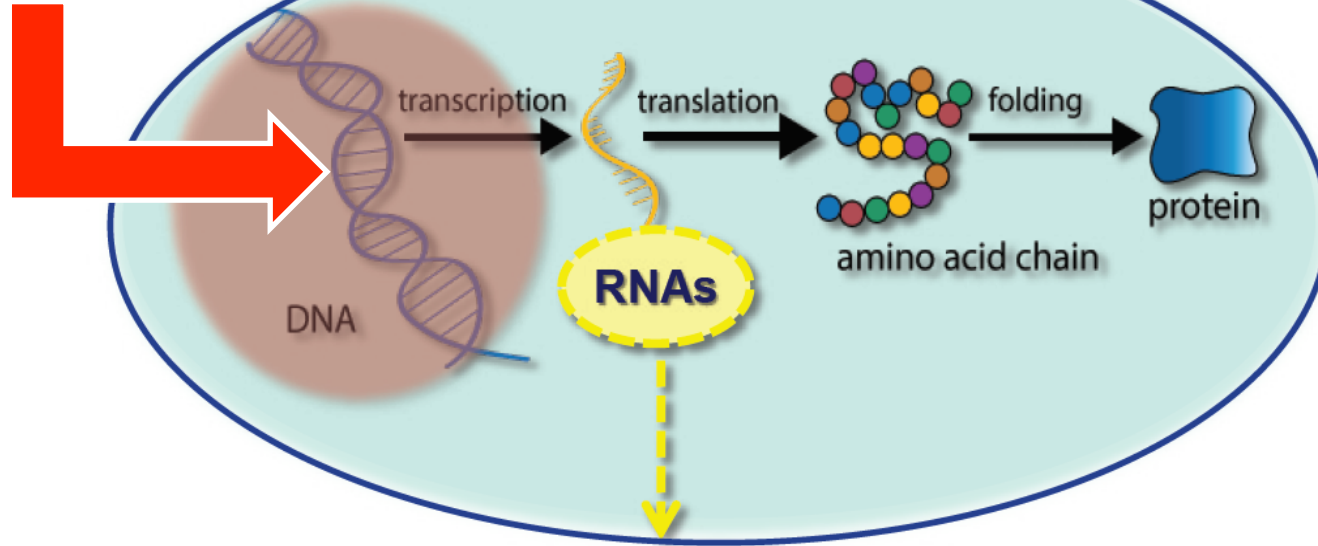
- Gènes de la fonction **neuronale** (TAC4 et GALR2) (2 neuropeptides)
- Gènes impliqués dans la transduction **olfactive**
- Gènes impliqués dans **l'inflammation**
- Gènes impliqués dans la **signalisation calcique** (Ca⁺⁺)
-

49↓ et 7↑

(The prevalence of down-regulation indicate a tendency to reduce cell excitability)

Anxiolytique /Céphalées/chocs affectifs et émotionnels

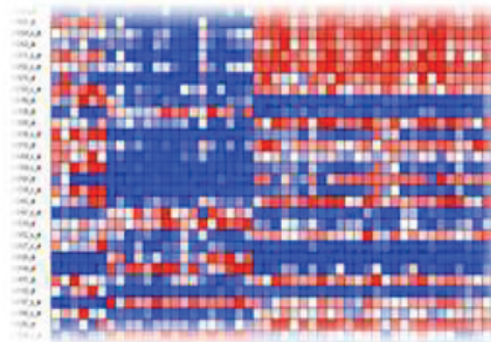
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environnementaux**

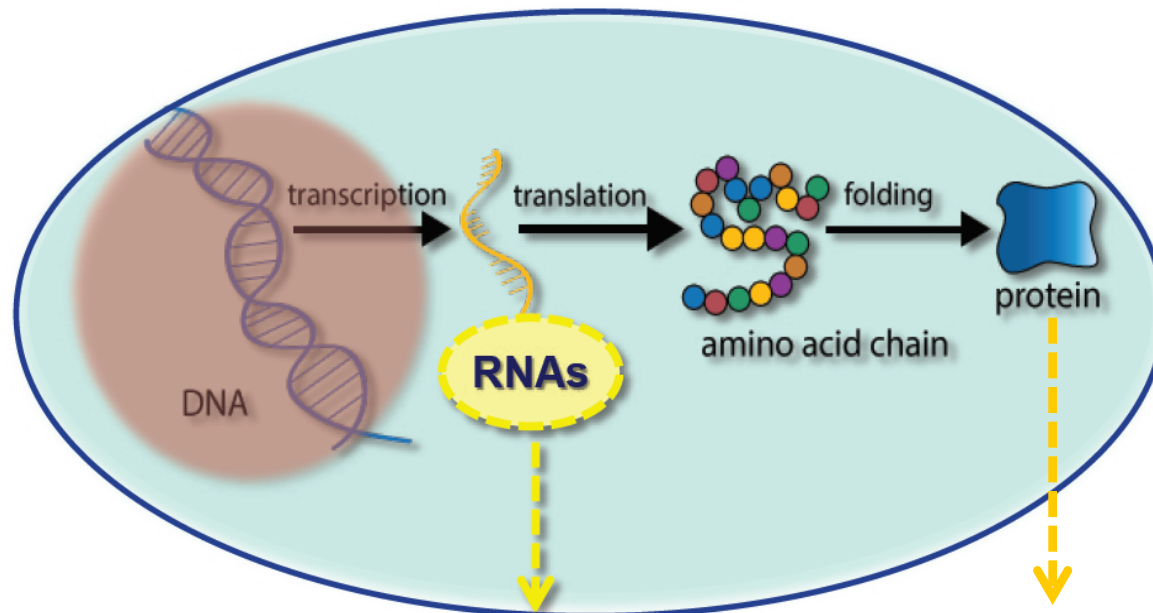


**Conséquences
phénotypiques**



Expression génique





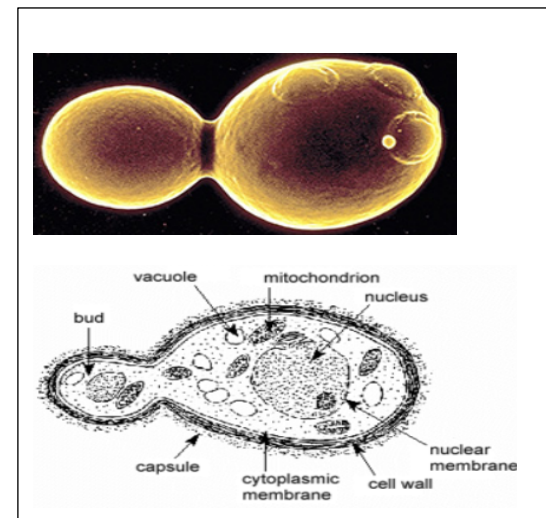
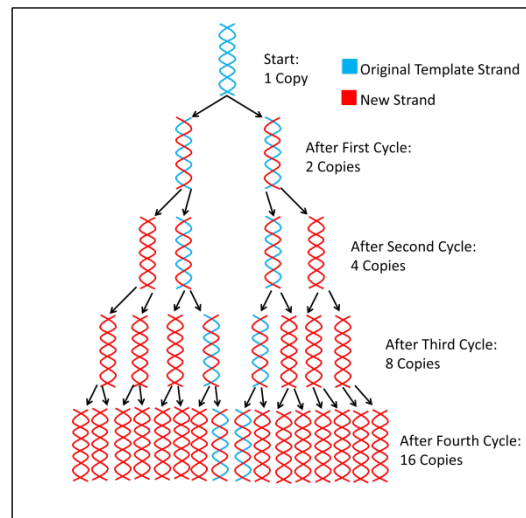
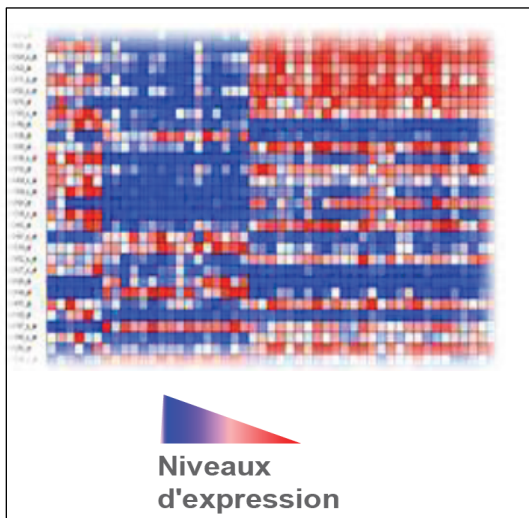
Expression génique

Expression génique

MicroArrays (Puces)

RT PCR

Expression hétérologue





Merci !