



***These GMOs
changing the world***

Prof. Gilles-Eric SERALINI
www.criigen.org

- Today humans know how to transform the hereditary patrimony of living beings at an industrial speed, and to pass across species: it would be a shame to avoid to question the methods of control
- What is done to study health risks by regulatory agencies ?
- IT IS A CRUCIAL QUESTION

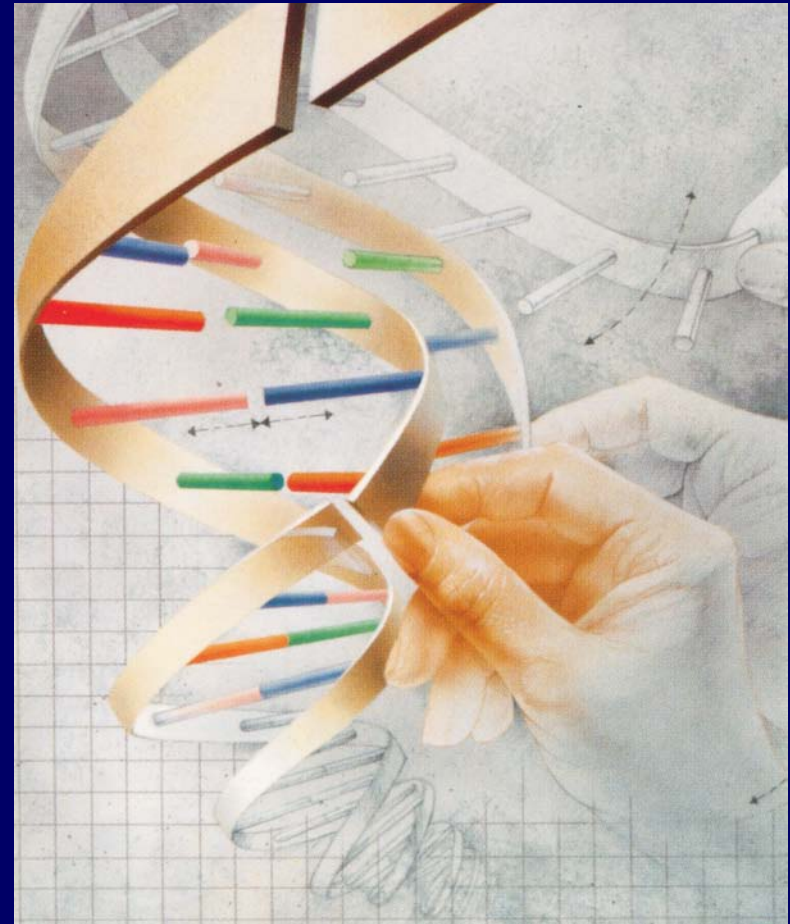
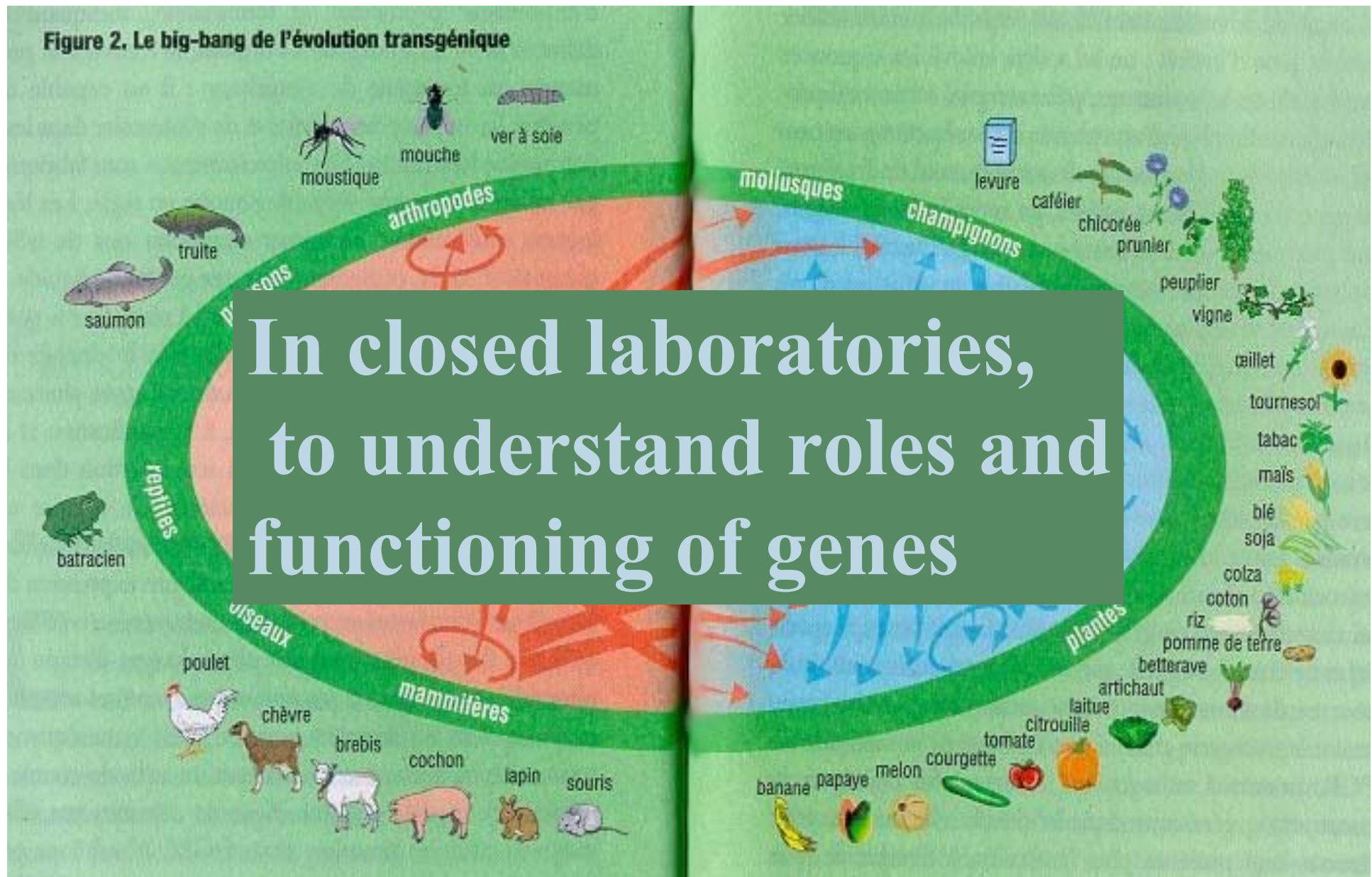


Figure 2. Le big-bang de l'évolution transgénique

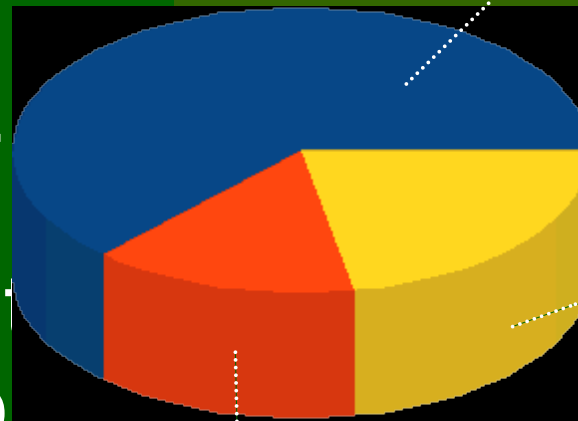


In Ces OGM qui changent le monde
de G.E. Séralini, Ed. Flammarion, coll. ' Champs '

Environmental GMOs : 100% pesticide plants

Still today

- Agricultural GMOs are modified just to tolerate or produce pesticides



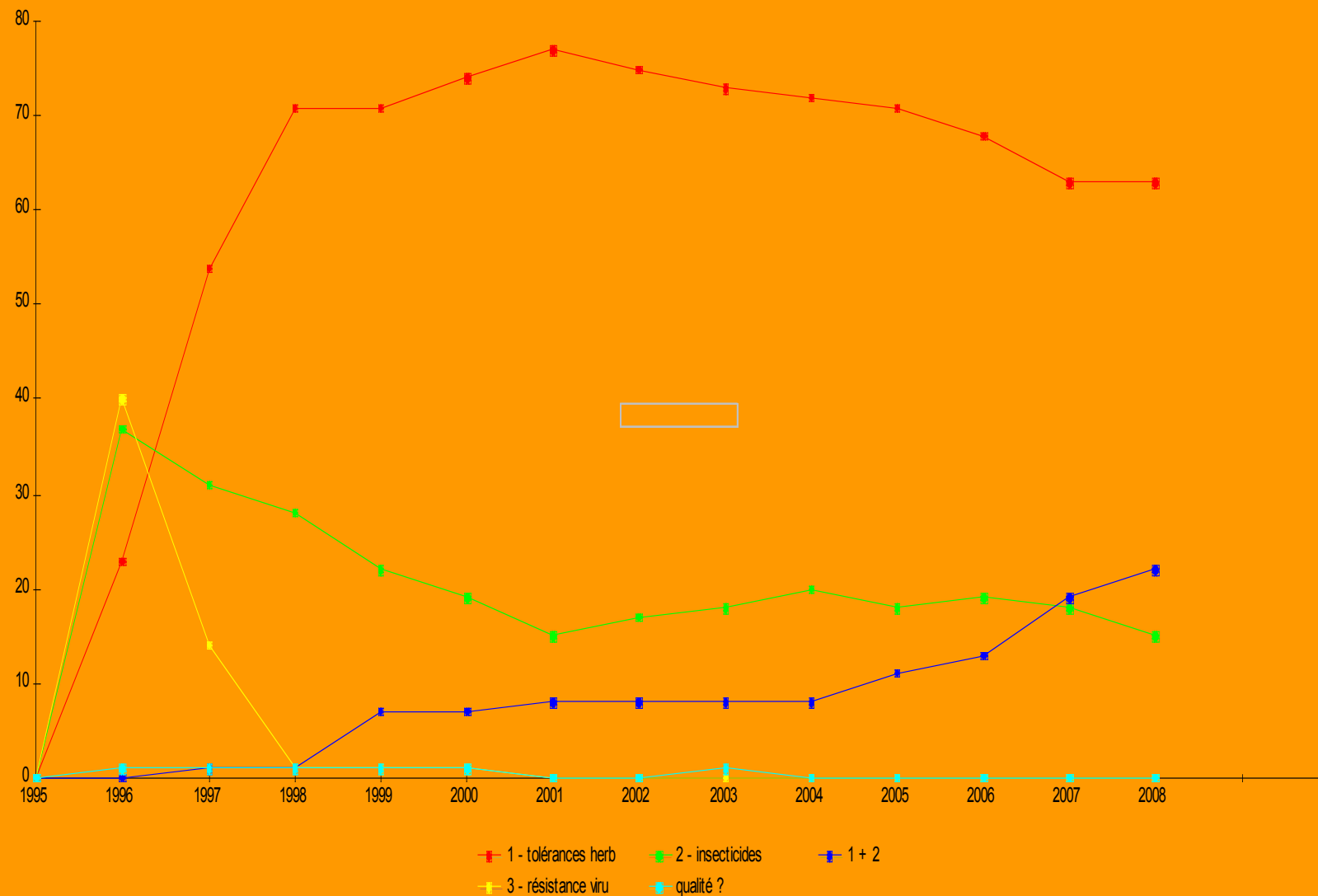
62% are herbicide tolerant (mostly to Roundup)
Contain lots of herbicide residues without dying
ex : soya, maize, oilseed rape, cotton

21% absorb and produce a pesticide (2-3 car.)

16% produce their own insecticide
ex: Bt maize

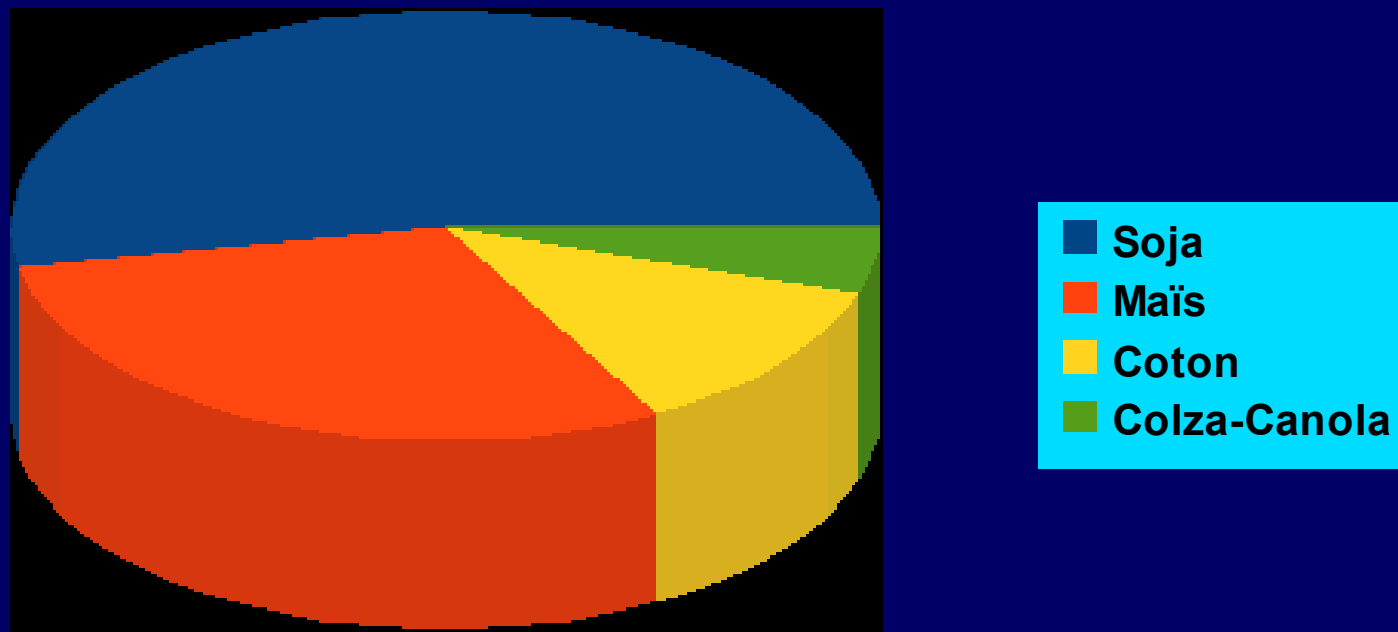
Source ISAAA, 2010

Caractères en % des OGM cultivés dans le monde 1995-2008



GMOs cultivated in the world, end 2009

**Extremely low diversity 134 millions ha,
8.9% of world cultures**



18% agriculture in USA, 97% edible GMOs produced in America (except indian and chinese cotton); 0.05% european cultures(Spain around 100.000 ha)

Source: IAAA 2009

Transgenic soya : herbicide tolerant

In fields :

- total herbicide (+)***
- others (-)***
- on short term***



***In the plant
or the seed :
total herbicide
and residues (+)(+)***



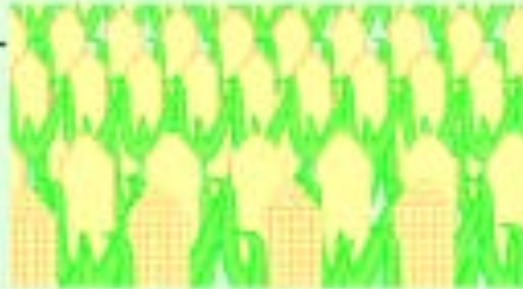
seed

► ***Possibility of accumulation of residues
because of herbicide tolerance*** ◀

Figure 9. Maïs transgénique insecticide

aux champs : _____

- insecticide \ominus
- herbicide \oplus
(comme avant)



dans la plante : _____

- toxine
insecticide \oplus

tige, feuilles et racines : _____

- toxine
insecticide $\oplus\oplus\oplus\oplus\oplus$



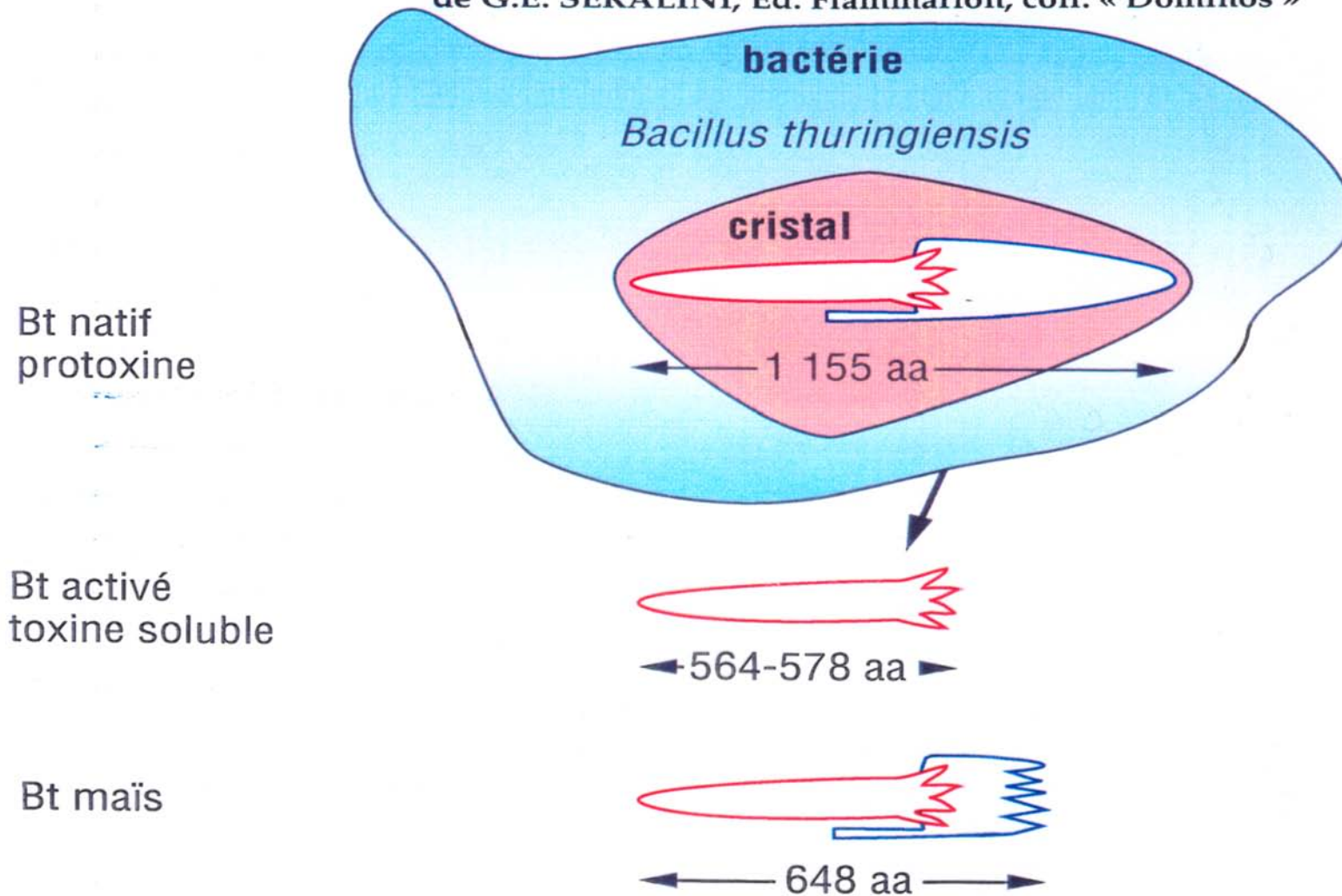
- effets à long terme ?
- insectes résistants (Bt)
- hybridation avec maïs non transgénique

*In Ces OGM qui
changent le monde
de G.E. Séralini,
Ed. Flammarion,
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Figure 6. La toxine Bt des OGM insecticides

in OGM Le Vrai Débat

de G.E. SERALINI, Ed. Flammarion, coll. « Dominos »



New Analysis of a Rat Feeding Study with a Genetically Modified Maize Reveals Signs of Hepatorenal Toxicity

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Abstract. Health risk assessment of genetically modified organisms (GMOs) cultivated for food or feed is under debate

numerous blood and organs parameters measured (Domingo 2000; Meningaud *et al.* 2001) and only one study with the

Exemple of what the transparency shows:

- ONLY 40 RATS MEASURED / 80 EATING GMOs ON A TOTAL OF 400 IN THE EXPERIMENT
- ONLY DURING 90 DAYS
- THE TWO MAJOR SCANDALS TO DECIDE THAT THE WHOLE POPULATION WILL EAT THAT FOR DECADES !!

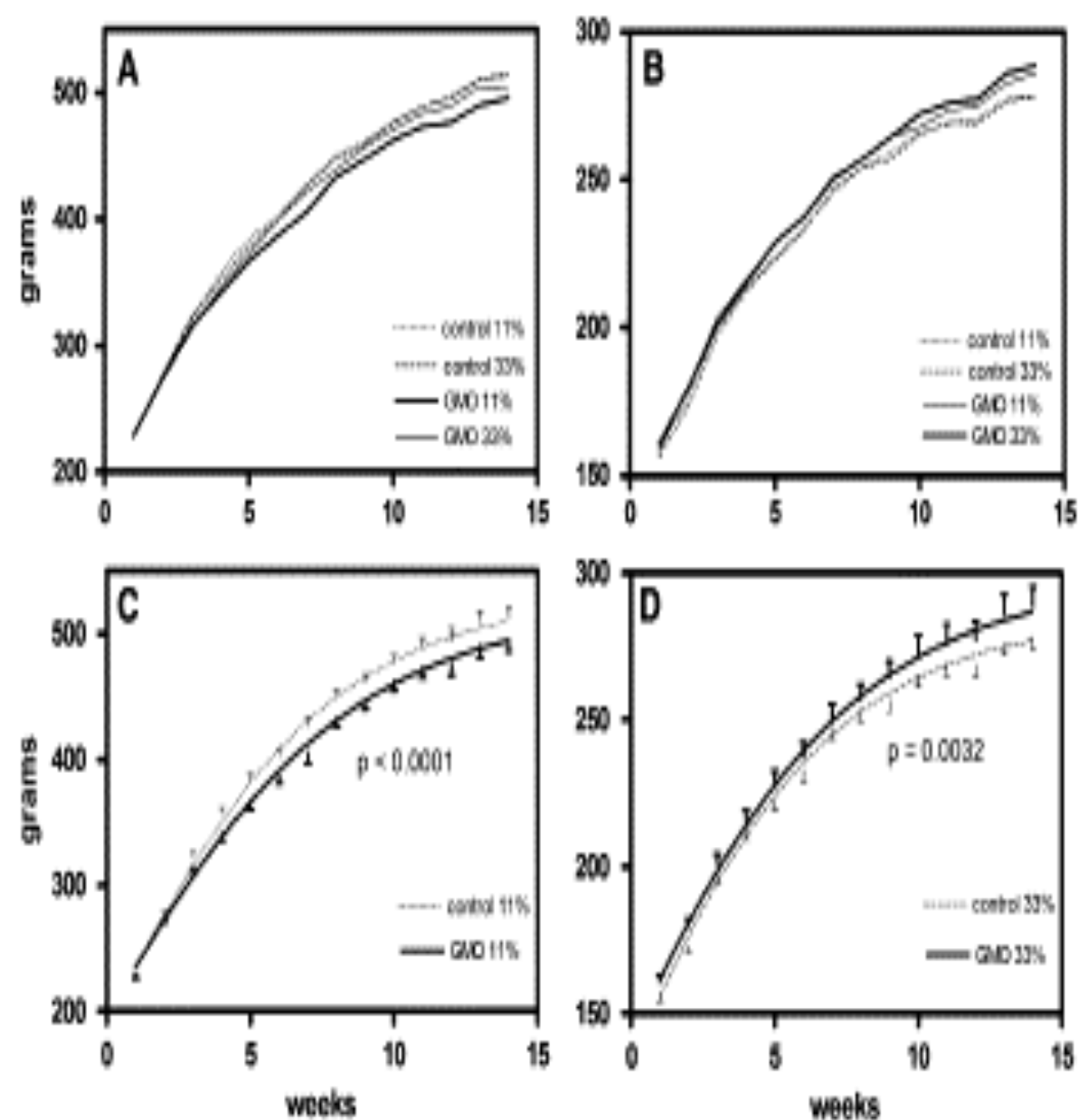


Fig. 1. Body weight growth for males (A, C) and females (B, D) over a period of 14 weeks. The experimental (A, B) and corresponding theoretical curves according to Gompertz models (C, D) are presented. The most important effects in each sex are in bold lines and statistically different from controls (see Materials and Methods)

Table 2. Differences between GMO-fed rats and controls

	Week	m 11%	m 33%	f 11%	f 33%
<i>Liver parameters</i>					
Albumin/globulin ratio	5	11*	-3	-9	4
Albumin/globulin ratio	14	6	-2	-18**	7
Albumin	5	-3	-2	-2	5*
Albumin	14	-2	3	-6*	5
Globulin	5	-12*	2	9*	1
Globulin	14	-8	7	15*	-2
Alanine aminotransferase	14	-30*	-8	37	4
Total protein	14	-5*	5*	1	3
Triglycerides	5	22	-2	-11	40**
Triglycerides	14	15	-1	24*	6
Liver weight	14	-1	-2	7**	6
Liver/brain ratio	14	-1	-3	6*	4
<i>Kidney parameters</i>					
Creatinin	14	-7	13*	13*	-2
Urine sodium	14	-23	-25*	11	-26
Urine sodium excretion	14	3	-35*	35	-24
Urine chloride excretion	5	35	3	50*	67*
Urine potassium	5	35*	-20	-3	-13
Urine phosphorus	5	3	-35*	24	-15
Urine phosphorus	14	-34	-31*	12	-8
Urea nitrogen	14	-8	4	17*	-1
Kidney weight	14	-3	-7*	3	2
Kidney/brain ratio	14	-3	-7*	1	1
Kidney % body weight	14	-1	-5*	-1	-1
<i>Pancreas</i>					
Glucose	14	-4	9	9*	10**
<i>Bone marrow</i>					
Neutrophils	5	5	22*	-14	3
Eosniophils	14	32	54*	20	0
Reticulocytes	14	15	-17	-35	-52*
Reticulocytes % RBC	14	16	-16	-36	-55*

23 / 58
parameters
disturbed:
40%

New Analysis of a Rat Feeding Study with a Genetically Modified Maize Reveals Signs of Hepatorenal Toxicity

Foies mâles	Poids corps	- 3,3 %
ALAT	14 sem 11%	- 30 %
Protéines tot.	14 sem 11%	- 5 %
Reins mâles	Poids reins	- 7% 14s 33%
Créatinine	14 sem 33%	+ 13 %
Excr. Na urin.	14 sem 33%	- 35 %
Phosph. Urin.	14 sem 33%	- 31 %
Néphropathie	histologie	
Foies femelles	Poids corps+3,7%	foies +7% 14s11%
Triglycérides	14 sem 11%	+ 24 %
Triglycérides	5 sem 33 %	+ 40 %
Glucose	14 sem 33%	+ 10 %
Reins femelles	Créatinine 14s 11%	+ 13 %
Excr. Cl urinaire	5 sem 11, 33 %	+ 50 et + 67 %
Urée	14 sem 11 %	+ 17 %

by Gilles-Eric Séralini, Dominique Cellier, Joël Spiroux de Vendomois
Arch. Environ. Contam. Toxicol. (2007), vol. 52, 596-602.



Review

Report of an Expert Panel on the reanalysis by Séralini et al. (2007) of a 90-day study conducted by Monsanto in support of the safety of a genetically modified corn variety (MON 863)

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Abstract

MON 863, a genetically engineered corn variety that contains the gene for modified *Bacillus thuringiensis* Cry3Bb1 protein to protect against corn rootworm, was tested in a 90-day toxicity study as part of the process to gain regulatory approval. This study was reanalyzed by Séralini et al. who contended that the study showed possible hepatorenal effects of MON 863. An Expert Panel was convened to assess the original study results as analyzed by the Monsanto Company and the reanalysis conducted by Séralini et al. The Expert Panel concludes that the Séralini et al. reanalysis provided no evidence to indicate that MON 863 was associated with adverse effects in the 90-day rat study. In each case, statistical findings reported by both Monsanto and Séralini et al. were considered to be unrelated to treatment or of no biological or clinical importance because they failed to demonstrate a dose–response relationship, reproducibility over time, association with other relevant changes (e.g., histopathology), occurrence in both sexes, difference outside the normal range of variation, or biological plausibility with respect to cause-and-effect. The Séralini et al. reanalysis does not advance any new scientific data to indicate that MON 863 caused adverse effects in the 90-day rat study.

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Criteria imposed by Doull et al. (2007) to take into account significant effects:

- Similarity between both sexes
- Proportional effects for 2 doses chosen a priori
- Correlations with organ lesions
- Under undefined « historical » norm ??
- Biologic plausibility !
- Are we in the middle ages of science ?

2. Terms of reference, scope, and methodology

To address possible issues raised by the Séralini et al. (2007) publication, Cantox Health Sciences, Inc. convened an Expert Panel of toxicologists and statisticians from North America and Europe. The terms of reference for

and Terron, 2004). An initial draft report was prepared by Lynch and Munro of Cantox Health Sciences, Inc. This draft was carefully and critically reviewed by the Expert Panel and was subsequently modified and re-written following meetings of the Expert Panel members.

Acknowledgement

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References

Review

How Subchronic and Chronic Health Effects can be Neglected for GMOs, Pesticides or Chemicals

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Research Paper

A COMPARISON OF THE EFFECTS OF THREE GM CORN ON MAMMALIAN HEALTH

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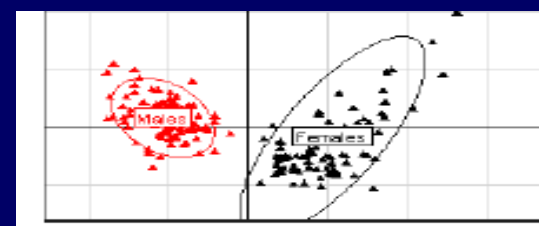
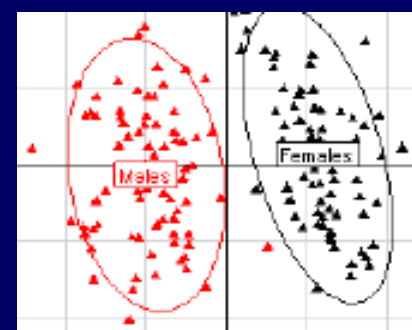
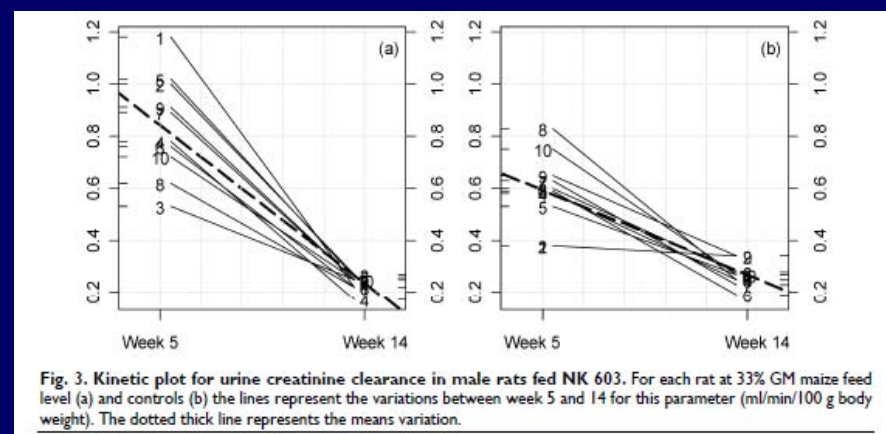
✉ Correspondence to: Prof. Gilles-Eric Séralini, Institute of Biology, EA 2608, University of Caen, Esplanade de la Paix, 14032 Caen Cedex, France. Phone +33 2 31 56 56 84; Fax +33 2 56 53 20; Email: criigen@unicaen.fr.

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Effects on health of GM maize NK603

19/58 parameters disturbed: 33%

Parameters	Week	Males 11%	Males 33%	Females 11%	Females 33%
BONE MARROW					
Absolute Lymphocytes	14	-12	29	-1	-23 *
Neutrophils	14	13	-34 **	4	16
Lymphocytes	14	-3	8 **	0	-2
Eosinophils (p)	5	38 *	-19	43	-13
Lar Uni Cell	5	4	-6	33 **	6
HEART					
Heart Wt	14	6	11 **	0	4
Heart % Body Wt	14	5	9 **	2	1
Heart % Brain Wt	14	6	9 *	-2	4
KIDNEY					
Urine Phosphorus	5	-15	67 **	-1	40 *
Urine Phosphorus	14	-10	97 **	12	28
Urine Sodium (p)	14	23	44 *	-7	37
Urine Potassium	14	-6	34 *	4	-13
Urine Creatinine Clearance	5	20	42 **	0	29
Blood Urea Nitrogen	5	-14 *	-13 *	13	-14
Creatinine	5	-25 *	-23 **	-6	-17
Phosphorus	5	2	-7 *	2	-8
Potassium	14	4	-2	5	13 **
LIVER					
Liver Wt	14	2	10 *	-4	1
Liver % Body Wt	14	1	5 *	-2	-2
Alkaline Phosphatase	14	2	3	29 *	16



Effets du maïs OGM MON 810

13/58 parameters disturbed : 22.4%

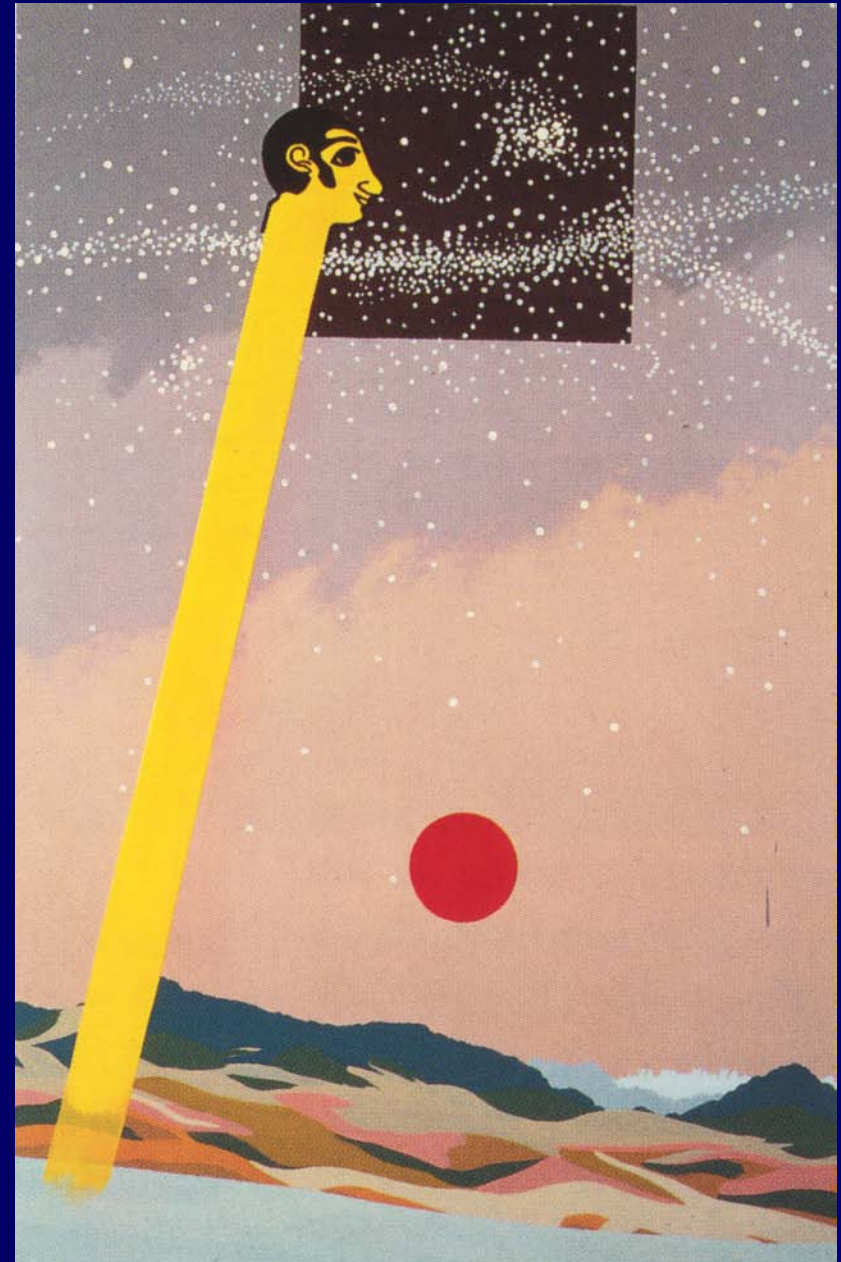
Parameters	Week	Males 11%	Males 33%	Females 11%	Females 33%
ADRENAL					
Adrenal Wt	14	7	-5	14 *	-2
Adrenal % Brain Wt	14	7	-6	14 *	-3
BONE MARROW					
White Blood Cell Count	5	-1	-12	8	-17 *
Absolute Lymphocytes	5	-3	-10	7	-17 *
Basophils	14	13	6	-4	-14 *
Lar Uni Cell (p)	5	-3	23	36 *	-12
KIDNEY					
Kidney Wt (p)	14	-2	1	7 *	0
Kidney % Brain Wt (p)	14	-2	-1	7 *	-1
Blood Urea Nitrogen	5	-2	-3	4	14 *
LIVER					
Albumin	5	0	-6 **	1	-2
Albumin	14	0	-7 **	-2	-2
Albumin/Globulin Ratio	5	-2	-11 *	-2	-3
Albumin/Globulin Ratio	14	1	-10 *	-11	0
SPLEEN					
Spleen Wt	14	-5	-7	18 *	10
Spleen % Brain Wt	14	-5	-8	18 *	9

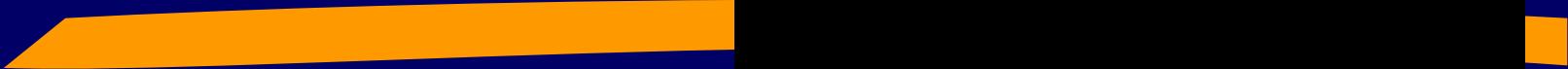
Exemple of what the transparency shows:

- EFSA RECOGNIZES THE INSUFFICIENCY OF MONSANTO's STATISTICS THEY HAVE ACCEPTED
- EFSA RECOGNIZES ALL SIGNIFICANT EFFECTS
- THE TWO OTHER SCANDALS !!
AND THEN THEY SHARE
MONSANTO's ARGUMENTS

CRIIGEN www.criigen.org is in favour of well controlled GMOs

- Today their evaluation is a major scientific shame in history
- The scientific negationism could be criminal, some persons are responsible for this lack of consideration of health risks
- We dream about transparency...



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- Published in february 2010
 - Pocket book
 - Ed. Flammarion