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## 转基因毒性试验法国科学家 Seralini(塞拉利尼)公开信



顾秀林

### [编者按]

光明网卫生频道“专家.专栏”作者顾秀林教授给我们提供了一篇译文，它是由刚刚公开、用二年时间拿小白鼠做了全球第一个转基因玉米毒性试验的法国科学家 Gilles-Eric Seralini（塞拉利尼）同全球 34 位科学家就转基因毒性问题撰写的一封公开信，这是 Seralini 先生不久前接受完法国电视台采访、用数据揭露全球转基因跨国企业压制科学界按严谨的科学研究流程的黑幕之后，又一次借助媒体反击转基因跨国企业近几十年来一直掩盖转基因作物存在潜在风险问题事实的行动。本网将顾秀林教授中译文及英文原文一齐登载，供有兴趣的人士参考。

**[翻译者顾秀林教授按]** 法国科学家塞拉利尼提出一个问题：在一个被大公司主导的世界中，科学所面临的挑战，究竟是什么挑战？

我来概括一下他的问题：在金钱的世界里，科学家有没有去推磨？

公开信的结尾说：“所谓安全性检测、所谓基于科学的管理、甚至科学程序本身，这一切是否能够实行，完全取决于科学家群体是否真诚地献身于公众利益、是否整体忠于科学操守。假如把这一切反过来，让一个科学产品的评估从起点开始就作弊，仅仅朝研发者的利益倾斜，依赖全面地一贯地压制独立科学家为公众利益所做的研究而推行，那么所谓诚实、理性或者科学的辩论，就是根本不可能的事情。”

——可不是吗，关于转基因风险的科学辩论在哪里？也许在生物技术公司大总裁的裤兜里？

中文译文翻译投稿时间：2012 年 10 月 4 日

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## 塞拉利尼给全球科学界的一封信

吉利斯-埃里克 塞拉利尼

(其他起草人的名单附后)

塞拉利尼等人发表的报告及其招致的媒体关注，揭示了一个非常深刻的问题：在一个被大公司主导的世界中，科学所面临的挑战，究竟是什么挑战？

### 第一 一项备受攻击的风险研究

塞拉利尼和同事遭受的，不过是最新的一轮有组织的攻击。最近几年发生过的同类事件中，包括有：

伯克利大学当时的助理教授 Ignacio Chapela 所做的关于墨西哥转基因玉米污染的报告(见 Quist 和 Chapela 在 2001 年报告)，他因此遭到了来自互联网浪潮般的污名攻击；据报道，那一次攻击是由黑客公关公司(Bivings Group)负责策划实施的，这家公司常受雇于孟山都公司，提供孟山都公司所需服务支持。

英国杰出的生物化学家阿帕德·普兹泰(Ewen and Pusztai, 1999a)因发表了转基因土豆问题的研究报告后，被迫终结了学术生涯。是英国皇家学会下了封口令，强制他退休、并没收他的数据，目的是不让他继续做研究(见 Ewen 和 Pusztai 在 1999b; Laidlaw 在 2003 年报告)。

转基因公司还采用人身暴力，最近的一次施暴是针对布宜诺斯艾利斯大学的分子胚胎学家安德烈斯·卡拉斯科教授 (Andres Carrasco)，因为他的研究报告中告诉公众，发现农达中的草甘膦成份存在对人畜健康有危害风险(见 Amnesty International 在 2010 年报告)。

因此,公众就不用奇怪为什么在 2009 年，第一次直接致信美国环保署、批评大公司控制对转基因农作物的研究的那 26 位昆虫学家，他们提交的是一封匿名信件( 见 Amnesty International 在 2010 年报告)。因为他们若署名可能会丢失工作甚至生命安全受到威胁。

### 第二 科学媒体的责任

一个很重要但很少被注意的问题是，转基因公司给科学界施加压力时，常见到科学媒体身影 (见 Ermakova 在 2007 年的报告; 见 Heinemann 和 Traavik 在 2007 年的报告; 见 Latham 和 Wilson 在 2007 年的报告)。

最近 Gilles-Eric Seralini (塞拉利尼) 等人的有关转基因玉米饲养小白鼠二年后的毒性科学报告在网络上公开发表后，来自名望最高的报道科学问题媒体，如《科学》，《纽约时报》，《新科学家》，还有《华盛顿邮报》，全都无一例外地展示媒体在批评与反对声中评论“中立性”，它们几乎都不让支持意见刊发(见 Carmen 在 2012 年的报告; Enserink 在 2012 年的报告; MacKenzie 在 2012 年的报告; Pollack 在 2012 年的报告)。而那些影响力可能差一点的媒体，如：《英国每日电讯报》，公众发现可能听到对这个研究的支持的科学观点(见 Poulter 在 2012 的报告)。



### 第三 误导性媒体报道

以往针对研究转基因风险问题的报道，转基因公司最拿手的媒体公关手段是：声东击西、鱼目混珠——让批评意见出现时像一条“青熏鱼”，云里雾里讲不清、很容易被调转方向，或直接就是谣言。

所以， Gilles-Eric Seralini（塞拉利尼）等人在 2012 年公布的研究报告，尽管是运用常规研究方法，却被媒体暗示为不靠谱、是假冒的科学，而那些之前转基因公司采用同样的研究方法，却是正确的（见上面引述的那些科学媒体 2012 年发布的相关稿件）。

这些媒体采用的误导性媒体报道手法，令非专业读者感到了疑惑和迷惘。

例如，伦敦国王学院（Kings College）的 Tom Sanders 被引述说：“这种实验鼠特别容易罹患乳腺肿瘤，尤其是在不限制摄食量的时候”（见 Hirschler 和 Kelland 在 2012 年的报告）。

但是, Tom Sanders 并没有指出，也许他确实不知道，几乎所有的转基因公司自己做喂养实验用的也都是这种试验大鼠, 名叫 SD 鼠(例如: Hammond 等在 1996, 2004, 2006 的研究以及 MacKenzie 等在 2007 年写的综述), 并且在那些实验中, 摄食量也不受限(例如 Malley 等在 2007 年的报告)。

Sanders 的评论产生了重要影响，因为他的观点被广为引述，而且他的说法成了英国皇家学会下面的科学媒体中心策划的，针对 Gilles-Eric Seralini（塞拉利尼）等人的研究报告最有组织的回击论点之一。这个科学媒体中心正是长期以来一直在封杀对转基因作物安全异议争论的操盘手，出资人正是生产转基因作物种子和杀虫剂的公司。

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and if you are a scientist or academic and would like your name added to this list, please email: [isneditor@biosciencesresource.org](mailto:isneditor@biosciencesresource.org) and write 'Seralini letter' in the headline, providing an affiliation if you wish.

可以连署，发电邮至上述邮箱 本人已经要求连署了。

A new paper by the French group of Gilles-Eric Seralini describes harmful effects on rats fed diets containing genetically modified maize (variety NK603), with and without the herbicide Roundup, as well as Roundup alone. This peer-reviewed study (Seralini et al., 2012), has been criticized by some scientists whose views have been widely reported in the popular press (Carmen, 2012; Mestel, 2012; Revkin, 2012; Worstall, 2012). Seralini et al. (2012) extends the work of other studies demonstrating toxicity and/or endocrine-based impacts of Roundup (Gaiv?o et al., 2012; Kelly et al., 2010; Paganelli et al., 2010; Romano et al., 2012), as reviewed by Antoniou et al. (2010). The Seralini publication, and resultant media attention, raise the profile of fundamental challenges faced by science in a world increasingly dominated by corporate influence. These challenges are important for all of science but are rarely discussed in scientific venues.

### Gilles-Eric Seralini

1) History of Attacks on Risk-finding Studies. Seralini and colleagues are just the latest in a series of

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researchers whose findings have triggered orchestrated campaigns of harassment. Examples from just the last few years include Ignacio Chapela, a then untenured Assistant Professor at Berkeley, whose paper on GM contamination of maize in Mexico (Quist and Chapela, 2001) sparked an intensive internet-based campaign to discredit him. This campaign was reportedly masterminded by the Bivings Group, a public relations firm specializing in viral marketing – and frequently hired by Monsanto (Delborne, 2008). The distinguished career of biochemist Arpad Pusztai, came to an effective end when he attempted to report his contradictory findings on GM potatoes (Ewen and Pusztai, 1999a). Everything from a gag order, forced retirement, seizure of data, and harassment by the British Royal Society were used to forestall his continued research (Ewen and Pusztai, 1999b; Laidlaw, 2003). Even threats of physical violence have been used, most recently against Andres Carrasco, Professor of Molecular Embryology at the University of Buenos Aires, whose research (Paganelli et al. 2010) identified health risks from glyphosate, the active ingredient in Roundup (Amnesty International, 2010). It was no surprise therefore, that when in 2009, 26 corn entomologists took the unprecedented step of writing directly to the US EPA to complain about industry control of access to GM crops for research, the letter was sent anonymously (Pollack, 2009).

2) The Role of the Science Media. An important but often unnoticed aspect of this intimidation is that it frequently occurs in concert with the science media (Ermakova, 2007; Heinemann and Traavik, 2007; Latham and Wilson, 2007). Reporting of the Seralini paper in arguably the most prestigious segments of the science media: Science, the New York Times, New Scientist, and the Washington Post uniformly failed to “balance” criticism of the research, with even minimal coverage of support for the Seralini paper (Carmen, 2012; Enserink, 2012; MacKenzie, 2012; Pollack, 2012). Nevertheless, less well-resourced media outlets, such as the UK Daily Mail appeared to have no trouble finding a positive scientific opinion on the same study (Poulter, 2012).

3) Misleading Media Reporting. A key pattern with risk-finding studies is that the criticisms voiced in the media are often red herrings, misleading, or untruthful. Thus, the use of common methodologies was portrayed as indicative of shoddy science when used by Seralini et al. (2012) but not when used by industry (see refs above and Science Media Centre, 2012). The use of red herring arguments appears intended to sow doubt and confusion among non-experts. For example, Tom Sanders of Kings College, London was quoted as saying: “This strain of rat is very prone to mammary tumors particularly when food intake is not restricted” (Hirschler and Kelland, 2012 ). He failed to point out, or was unaware, that most industry feeding studies have used Sprague-Dawley rats (e.g. Hammond et al., 1996, 2004, 2006; MacKenzie et al., 2007). In these and other industry studies (e.g. Malley et al. 2007), feed intake was unrestricted. Sanders’ comments are important because they were widely quoted and because they were part of an orchestrated response to the Seralini study by the Science Media Centre of the British Royal Institution. The Science Media Centre has a long history of quelling GMO controversies and its funders include numerous companies that produce GMOs and pesticides.

4) Regulator Culpability. In our view a large part of the ultimate fault for this controversy lies with regulators. Regulators, such as EFSA (the European Food Safety Authority) in Europe and the EPA (Environmental Protection Agency) and FDA (Food and Drug Administration) in the US, have enshrined protocols with little or no potential to detect adverse consequences of GMOs (Schubert, 2002; Freese and Schubert, 2004; Pelletier, 2005). GMOs are required to undergo few experiments, few endpoints are



examined, and tests are solely conducted by the applicant or their agents. Moreover, current regulatory protocols are simplistic and assumptions-based (RSC, 2001), which by design, will miss most gene expression changes – apart from the target trait - induced by the process of transgene insertion (Heinemann et al., 2011; Schubert, 2002). Puzstai (2001) and others have consequently argued that well-conducted feeding trials are one of the best ways of detecting such unpredictable changes. Yet feeding trials are not mandatory for regulatory approval, and the scientific credibility of those which have been published to date has been challenged (Domingo, 2007; Puzstai et al., 2003; Spiroux de Vend?mois et al., 2009). For example, Snell et al. (2012), who assessed the quality of 12 long term (>96 days) and 12 multigenerational studies, concluded: “The studies reviewed here are often linked to an inadequate experimental design that has detrimental effects on statistical analysis...the major insufficiencies not only include lack of use of near isogenic lines but also statistical power underestimation [and], absence of repetitions...”. Apparently, the same issues of experimental design and analysis raised about this (Seralini) risk-finding study were not of concern to critics when the studies did not identify risk, resulting in ill-informed decision-makers. In the end, it is a major problem for science and society when current regulatory protocols approve GMO crops based on little to no useful data upon which to assess safety.

5) Science and Politics. Governments have become habituated to using science as a political football. For example, in a study conducted by the Royal Society of Canada at the request of the Canadian government, numerous weaknesses of GM regulation in Canada were identified (RSC, 2001). The failure of the Canadian government to meaningfully respond to the many recommended changes was detailed by Andree (2006). Similarly, the expert recommendations of the international IAASTD report, produced by 400 researchers over 6 years, that GMOs are unsuited to the task of advancing global agriculture have been resolutely ignored by policymakers. Thus, while proclaiming evidence-based decision-making, governments frequently use science solely when it suits them.

6) Conclusion: When those with a vested interest attempt to sow unreasonable doubt around inconvenient results, or when governments exploit political opportunities by picking and choosing from scientific evidence, they jeopardize public confidence in scientific methods and institutions, and also put their own citizenry at risk. Safety testing, science-based regulation, and the scientific process itself, depend crucially on widespread trust in a body of scientists devoted to the public interest and professional integrity. If instead, the starting point of a scientific product assessment is an approval process rigged in favour of the applicant, backed up by systematic suppression of independent scientists working in the public interest, then there can never be an honest, rational or scientific debate.

(1) In addition, US scientists who publish studies finding adverse environmental effects are frequently vehemently attacked by other pro-GM scientists. As a report in Nature, which discusses numerous examples, points out, “Papers suggesting that biotech crops might harm the environment attract a hail of abuse from other scientists. Behind the attacks are scientists who are determined to prevent papers they deem to have scientific flaws from influencing policy-makers. When a paper comes out in which they see problems, they react quickly, criticize the work in public forums, write rebuttal letters, and send them to policy-makers, funding agencies and journal editors” (pg. 27 in Waltz. 2009a). Indeed, when one of us wrote a Commentary in Nature Biotechnology ten years ago suggesting that more attention needs to be paid to the potential unintended effects associated with insertional mutagenesis, we received a flood of



responses, and an administrator at the Salk Institute even said that the publication “was jeopardizing funding for his institution” (see Waltz, 2009a). Similar attacks have greeted studies on adverse effects of Bt toxins on ladybird beetles and green lacewing larvae, which were used by German authorities to ban cultivation of Mon810, a Bt corn variety (see: Hilbeck et al.2012a,b, respectively). In 2009, a group of 26 public sector corn entomologists sent a letter to the US Environmental Protection Agency which stated “No truly independent research can be legally conducted on many critical questions involving these crops [because of company-imposed restrictions]” (pg. 880 in Waltz, 2009b it was no surprise that the letter was sent anonymously as the scientists feared retribution from the companies that funded their work (Pollack, 2009). Furthermore, industry control over what research can be conducted in the US means that adverse findings can effectively be suppressed. In one example cited in the article, Pioneer was developing a binary Bt toxin, Cry34Ab1/Cry35Ab1, against the corn rootworm. In 2001, Pioneer contracted with some university laboratories to test for unintended effects on a lady beetle. The laboratories found that 100% of the lady beetles died after eight days of feeding. Pioneer forbade the researchers from publicizing the data. Two years later Pioneer received approval for a Bt corn variety with Cry34Ab1/Cry35Ab1 and submitted studies showing that lady beetles fed the toxin for only 7 days were not harmed. The scientists were not allowed to redo the study after the crop was commercialized (Waltz, 2009b). In another example, Dow AgroSciences threatened a researcher with legal action if he published information he had received from US EPA. As the article notes, “The information concerned an insect-resistant variety of maize known as TC1507, made by Dow and Pioneer. The companies suspended sales of TC1507 in Puerto Rico after discovering in 2006 that an armyworm had developed resistance to it. Tabashnik was able to review the report the companies filed with the EPA by submitting a Freedom of Information Act request. “I encouraged an employee of the company [Dow] to publish the data and mentioned that, alternatively, I could cite the data,” says Tabashnik. “He told me that if I cited the information...I would be subject to legal action by the company,” he says. “These kinds of statements are chilling” (pg. 882 in Waltz, 2009b).

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