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Trends in **AMERICAN** **EUROPEAN** Press Coverage of Synthetic Biology

TRACKING THE LAST FIVE YEARS OF COVERAGE



SYNBIO 1 / NOVEMBER 2008



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Written by

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SYNBIO 1 / NOVEMBER 2008

Synthetic
BIOLOGY
PROJECT

“Man could be on the brink of creating the first artificial organism, a landmark development that would provide a profound insight into the origins, workings and essence of life, and vast new opportunities to exploit living organisms. But this pioneering research has inevitable triggered unease about the limits of science, fears about ‘playing god,’ and raises the specter that this technology could one day be abused.”

—ROGER HIGHFILED, *THE TELEGRAPH*, JUNE 29, 2007



Rationale for Analyzing Synthetic Biology Press Coverage

The field of synthetic biology is rapidly growing and evolving as it establishes itself in the scientific community. Consequently, the emergence of synthetic biology has been increasingly reported in the press of different countries. At this early stage, it is worthwhile to note that the coverage of synthetic biology varies from country to country; with some countries emphasizing potential risks or benefits, others focusing on future applications, and still others examining the social and ethical concerns that might arise as the technology is developed.

Unanswered by this analysis and by social science researchers is the question of the precise role the media plays in shaping public perceptions about an emerging technology. Do sensationalist headlines create irrational public fear? Is popular reaction to facts contained in press articles about a new technology more influenced by people's own cultural outlooks and their views regarding the editorial bias of a particular media outlet than by the information itself?

The objective of this report is not to draw exhaustive conclusions on the press coverage of synthetic biology but rather to provide readers with a qualitative insight on how synthetic biology is being introduced into public discourse and the popular press. Ultimately, this report aims to highlight the main trends and the emerging areas of convergences and differences that characterize the coverage of synthetic biology in prominent American and European print media outlets.

Finally, the present overview relies on the findings of two press coverage analyses presented in the appendices¹ that examine which aspects of synthetic biology may be welcomed by the public and which concerns may lead to the public's potential uneasiness. This report concludes with an agenda for future social science research that can inform our understanding of how public perceptions of synthetic biology develop.

1. Appendix A: I. Ifrim, "Synthetic Biology: A Survey of American Press Coverage (January 2003–January 2008)"; Appendix B: E. Pauwels, "Synthetic Biology: A Survey of European Print Media Coverage (January 2003–January 2008)." www.synbioproject.org/news/project/press



“Synthetic biology poses a conundrum because of its double-edged ability to both wreak biological havoc and perhaps wean civilization from dirty 20th-century technologies and petroleum-based fuels.”

—RICK WEISS, “SYNTHETIC DNA ON THE BRINK OF YIELDING NEW LIFE FORMS”, *THE WASHINGTON POST*, DECEMBER 17, 2007.



Main Questions

Question 1:

WAS THERE SUBSTANTIVE PRESS COVERAGE OF SYNTHETIC BIOLOGY?

Both the American and European press analyses² found that there is significant coverage of synthetic biology in the media on both sides of the Atlantic, with multiple stories on synthetic biology appearing in a number of large-circulation newspapers in the United States and in various European countries between January 2003 and January 2008.

2. Appendix A: I. Ifrim, "Synthetic Biology: A Survey of American Press Coverage (January 2003–January 2008)"; Appendix B: E. Pauwels, "Synthetic Biology: A Survey of European Print Media Coverage (January 2003–January 2008)." www.synbioproject.org/news/project/press

Ranking of American and European press articles on synthetic biology, by number of articles during January 2003–January 2008

FIGURE 1

United States

<i>New York Times</i>	10
<i>San Francisco Chronicle</i>	7
<i>Boston Globe</i>	6
<i>Seattle Times</i>	6
<i>Washington Post</i>	5
<i>Houston Chronicle</i>	5
<i>Los Angeles Times</i>	5
<i>Pittsburgh Post-Gazette</i>	3
<i>Chicago Tribune</i>	2
<i>Buffalo News</i>	2
Other	14

FIGURE 2

Europe

<i>The Guardian</i> (UK)	18
<i>Le Monde</i> (France)	8
<i>Le Temps</i> (Switzerland)	7
<i>Die Zeit</i> (Germany)	7
<i>de Volkskrant</i> (Netherlands)	6
<i>Telegraph</i> (UK)	6
<i>The Economist</i> (UK)	6
<i>Frankfurter Allgemeine Zeitung</i> (Germany)	5
<i>El Mundo</i> (Spain)	5
<i>Telepolis</i> (Germany)	5
Other	39

American Press Reporting

The American press analysis³ shows that between 2003 and 2007, the number of news stories mentioning synthetic biology increased eight-fold:

The number of news stories in the United States that mention the potential benefits of synthetic biology outnumbered those mentioning potential risks, with more than 50 percent of American news stories exclusively mentioning the potential benefits.

3. Appendix A: I. Ifrim, "Synthetic Biology: A Survey of American Press Coverage (January 2003–January 2008)." A brief description of the methodology employed in this reports follows (p. 25–26), but for a full description of the data collection and analysis techniques for this report, please see the respective study methodology.

FIGURE 3: Number of American news stories about synthetic biology per year (2003–2007)

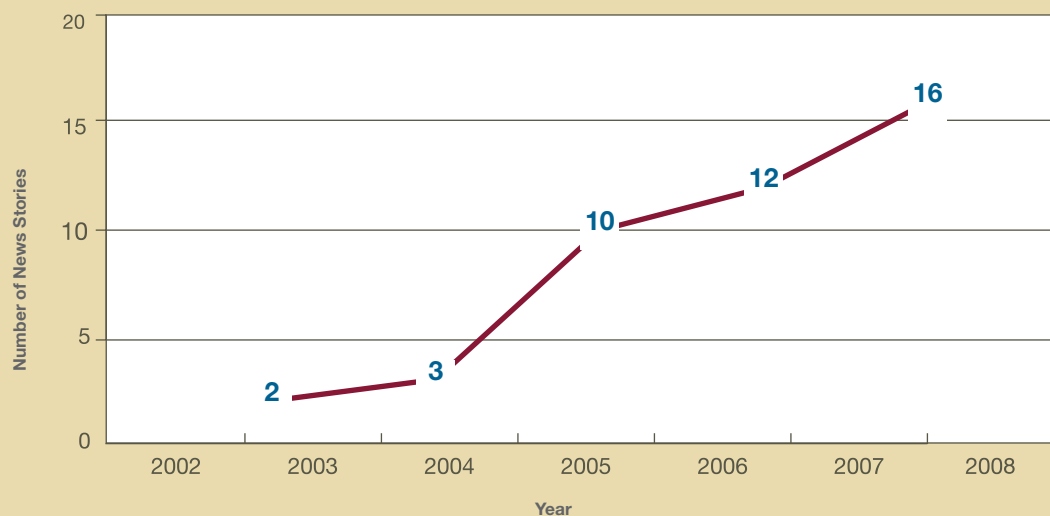


FIGURE 4: Percentage of news stories regarding synthetic biology in American press that mention potential benefits, potential risks, or both (January 2003–January 2008)

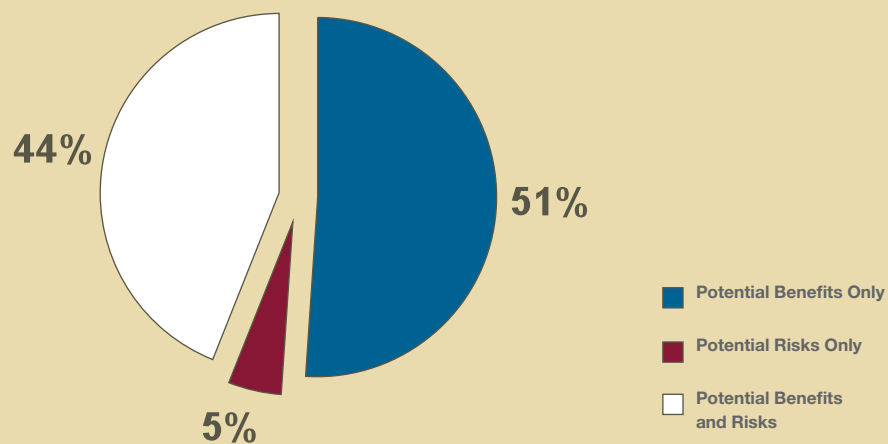


FIGURE 5: Number of news stories about synthetic biology in European press, per year (2003-2007)

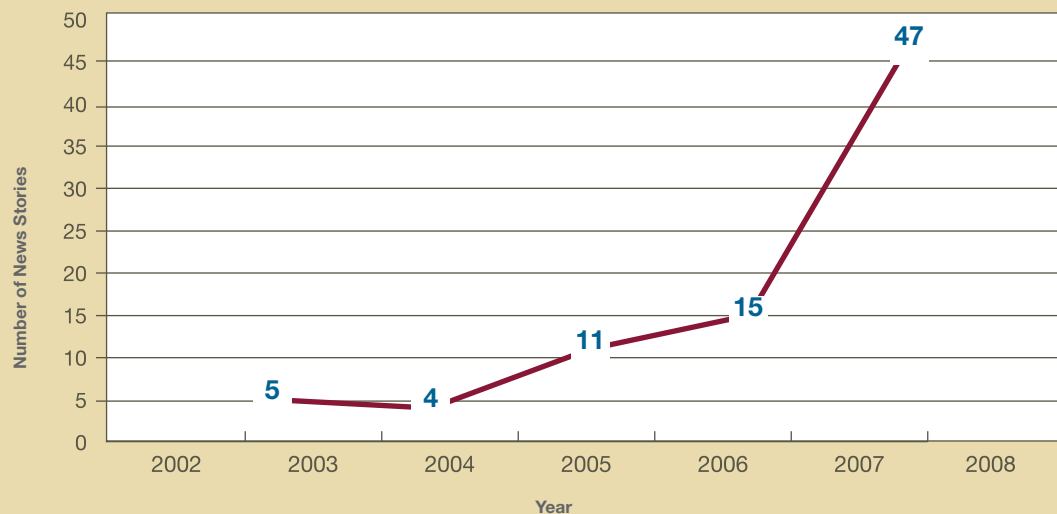
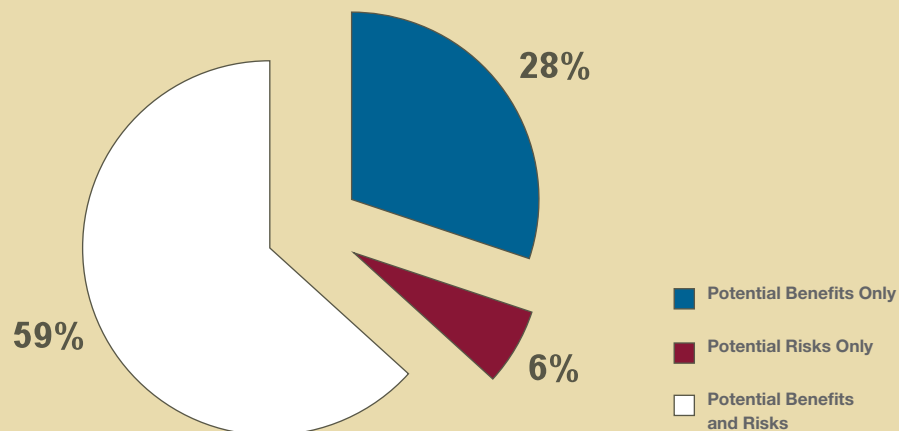


FIGURE 6: Percentage of news stories regarding synthetic biology in European press that mention potential benefits, potential risks, or both (January 2003-January 2008)



European Press Reporting

The European press analysis¹ shows that, between 2003 and 2007, the number of European news stories mentioning synthetic biology increased nine fold.

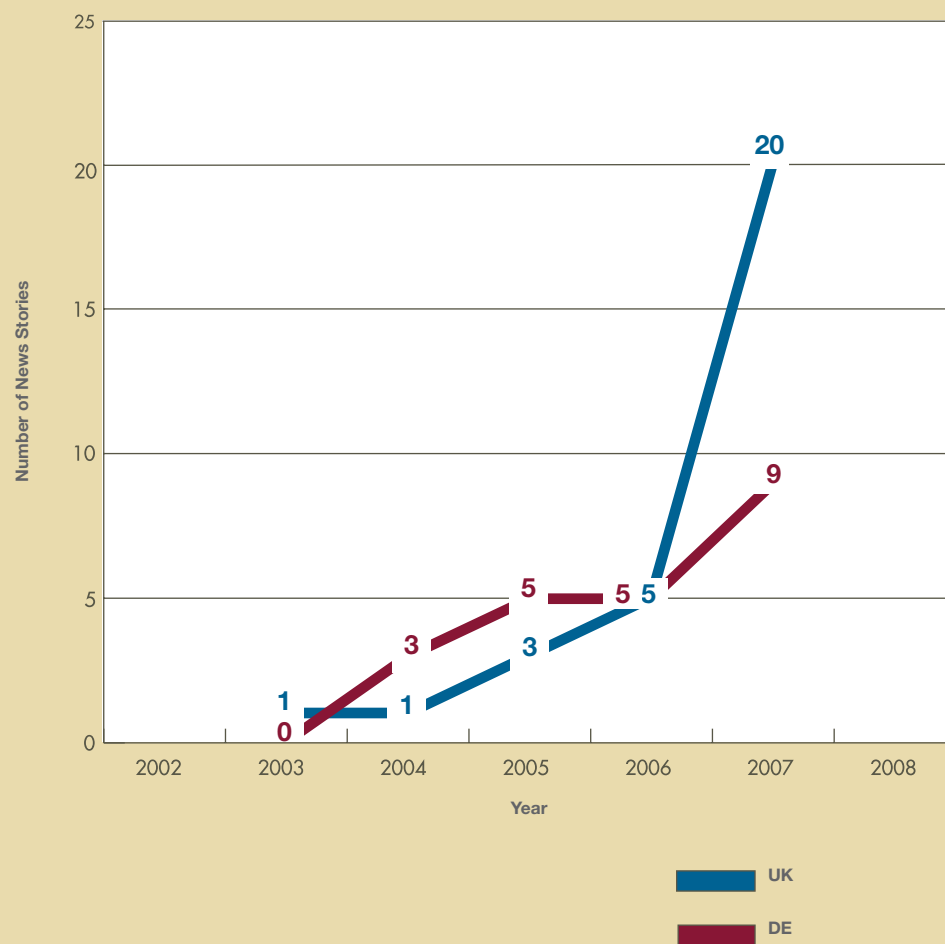
The analysis also found that the number of news stories mentioning potential benefits of synthetic biology in the European press outnumbered those mentioning potential risk, but only 28 percent of the stories published by European press did not mention any potential risks.

4. Appendix B: E. Pauwels, "Synthetic Biology: A Survey of European Print Media Coverage (January 2003-January 2008)." A brief description of the methodology employed in this reports follows (p. 25-26), but for a full description of the data collection and analysis techniques for this report, please see the respective study methodology.

British and German Press Reporting

Although the European press analysis covers several nations, the United Kingdom (UK) and Germany are the largest contributors to the coverage of synthetic biology. Indeed, as shown by the graph below, the growth in press coverage in the UK and Germany was significant between 2003 and 2007 and accounted for more than one half of the total European coverage.

FIGURE 7: Number of news stories about synthetic biology in British and German press, per year (2003-2007)



Reasons for Coverage

Several developments in the field of synthetic biology have brought press and public attention to the field. The organization of three international conferences dedicated to synthetic biology, along with the launch, growth and continued success of the international Genetically Engineered Machine (iGEM) competition, as a complement to the BioBricks Foundation at the Massachusetts Institute of Technology (MIT), have highlighted the development of synthetic biology as an emerging field.

The 2004 international conference SB.01, organized by the MIT research team, helped stimulate the enthusiasm that accompanied synthetic biology developments in the American press and, to a lesser extent, the European press. Then, in 2006, SB.02, which was organized in Berkeley, California, received substantial news coverage when it concluded that claims made by several civil society organizations had to be addressed at the first stage of the synthetic biology debate. SB.03, which took place in Zurich, Switzerland in 2007, took a significant first

step toward promoting an international and inclusive public debate by including a representative of civil society⁵ in the meeting and sparking significant attention from the European press.

The iGEM competition also provided a compelling explanation for the rising media coverage, especially during 2006–2007.⁶ Academic participation in the competition increased exponentially, from five research teams in 2004, to 85 research teams in 2008. Of the 85 research teams involved, over 20 came from European universities; some of which (i.e., the University of Groningen and Imperial College) have dedicated educational and research programs to synthetic biology.⁷

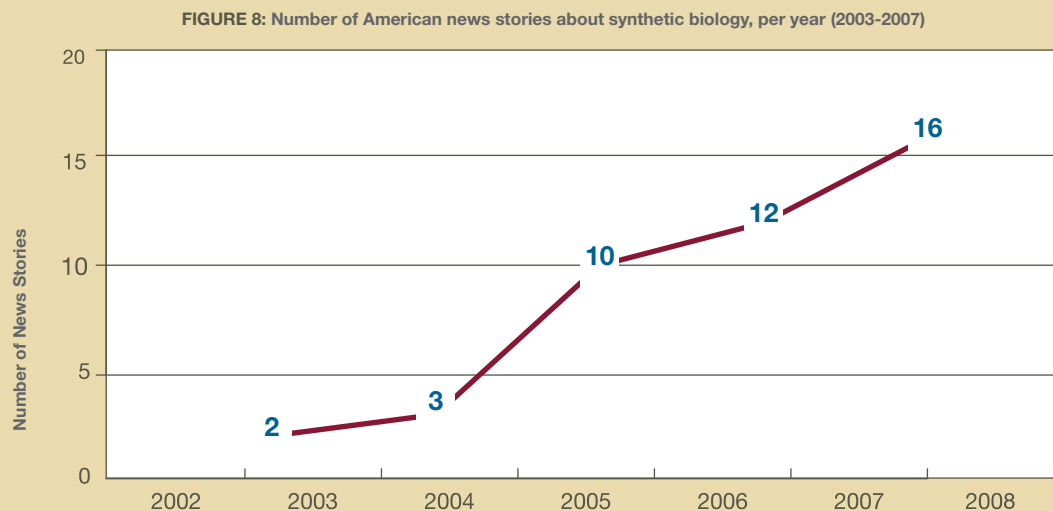
5. Parens, E., Johnston, J., Moses, J. *Ethical Issues in Synthetic Biology: An Overview of the Debates*, The Hastings Center, Garrison, New York, 2008, p. 11.

6. iGEM Competition Main Webpage, cf. http://parts2.mit.edu/wiki/index.php/Main_Page

7. Parliamentary Office of Science and Technology, *Postnote – Synthetic Biology*, January 2008, N° 298, p. 3; Rinie Van Est, Huib de Vriend, Bart Walhout, *Constructing Life – The World of Synthetic Biology*, November 2007, Rathenau Instituut, p. 8.



U.S. News Stories on Synthetic Biology



International Conferences on Synthetic Biology	SB.01, MIT June 2004	SB.02, UC Berkeley May 2006	SB.03, ETH Zurich June 2007
International Genetically Engineered Machine Competitions	iGEM, MIT June 2004	iGEM 2, MIT November 2006	iGEM 3, MIT November 2007

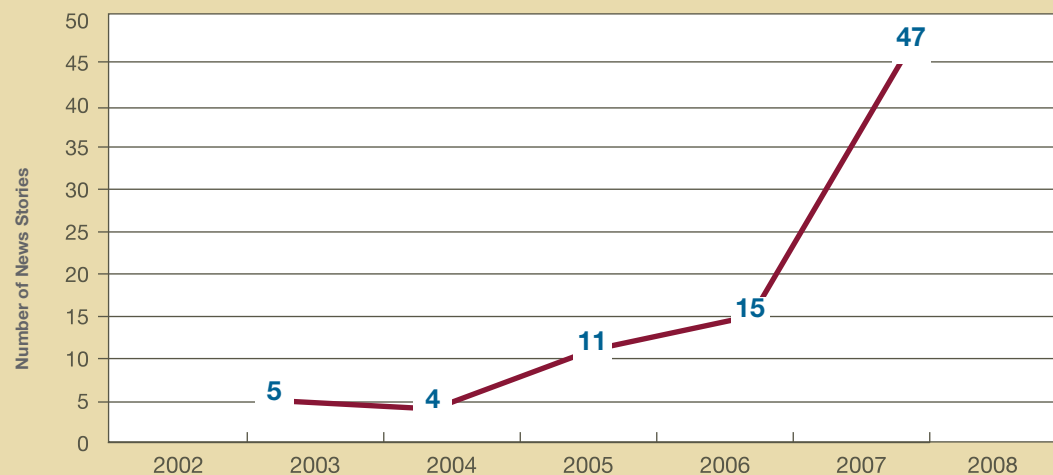


FIGURE 9: Number of news stories about synthetic biology in European press, per year (2003-2007)

Question 2:

WHO DOES THE PRESS MENTION IN RELATION TO SYNTHETIC BIOLOGY?

Companies

As synthetic biology matures, several companies have already been established that will develop and market the applications. Both reports show that media most often mentioned Synthetic Genomics, while other companies, such as LS9 or Amyris Biotechnologies, made the top-five list of most mentioned companies in European and American press. While the American press focused almost exclusively on American companies, the European press was more inclusive. Of the five companies most mentioned by European newspapers, the top four were in the United States. However, European newspapers also mentioned European firms such as the British-based VH BIO Ltd. and Geneart in Germany.

FIGURE 10: Companies most mentioned in American press (January 2003-January 2008)

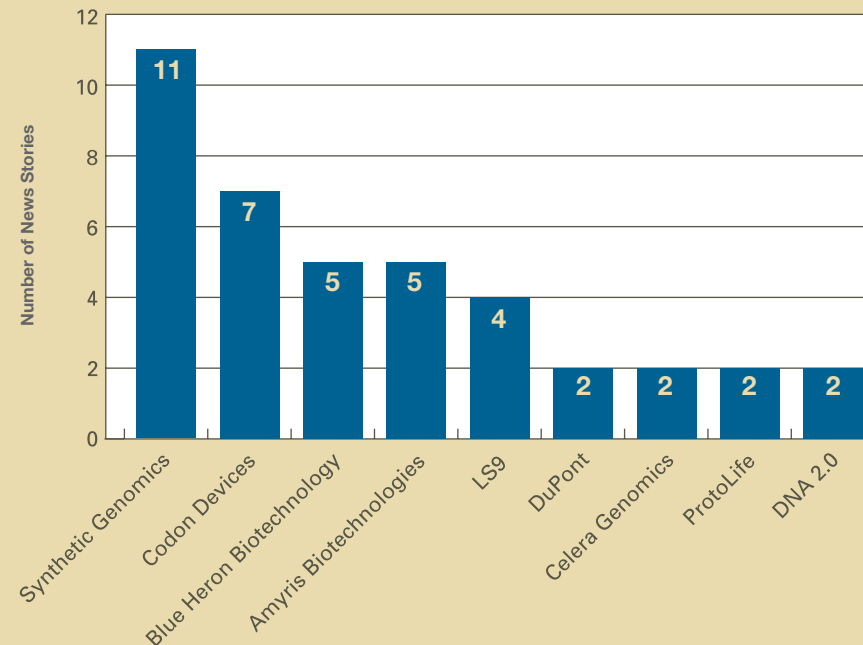
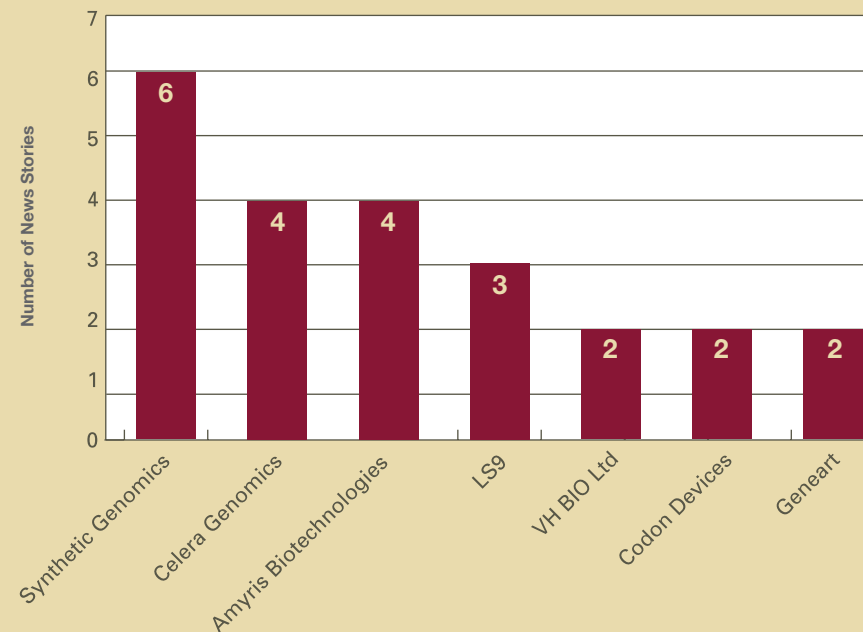


FIGURE 11: Companies most mentioned in European press (January 2003-January 2008)



Universities

As with the press coverage of companies, the American and European press analyses showed that media differ in their reporting of universities doing research in synthetic biology. While MIT was mentioned the most by both the American and European press, the top nine universities most mentioned by American press were exclusively American while the European press featured three European schools in their list of nine frequently mentioned schools, with the rest being American. The European press focused heavily on European academic institutions and did not mention any Asian universities conducting synthetic biology research. On the other hand, the American press mentioned two Asian universities, both from China.

FIGURE 12: Top 9 Universities mentioned by American press (January 2003-January 2008)

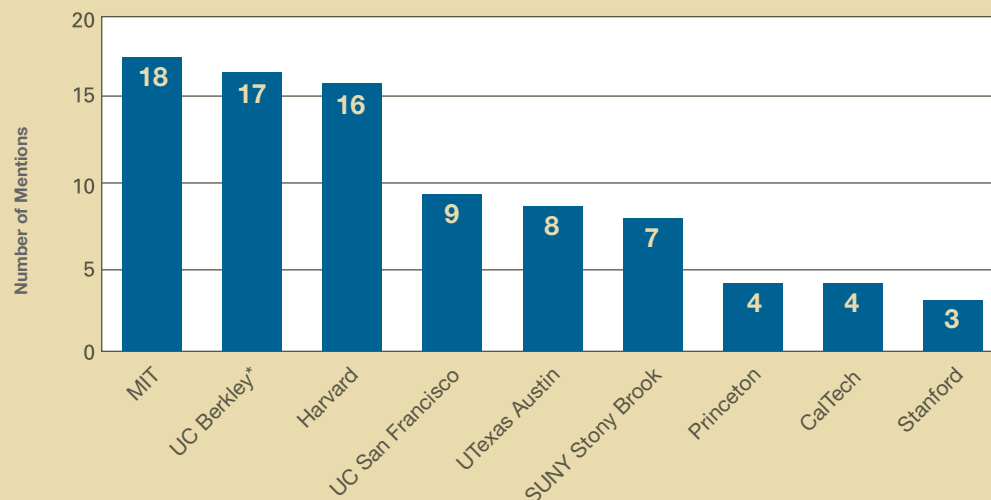
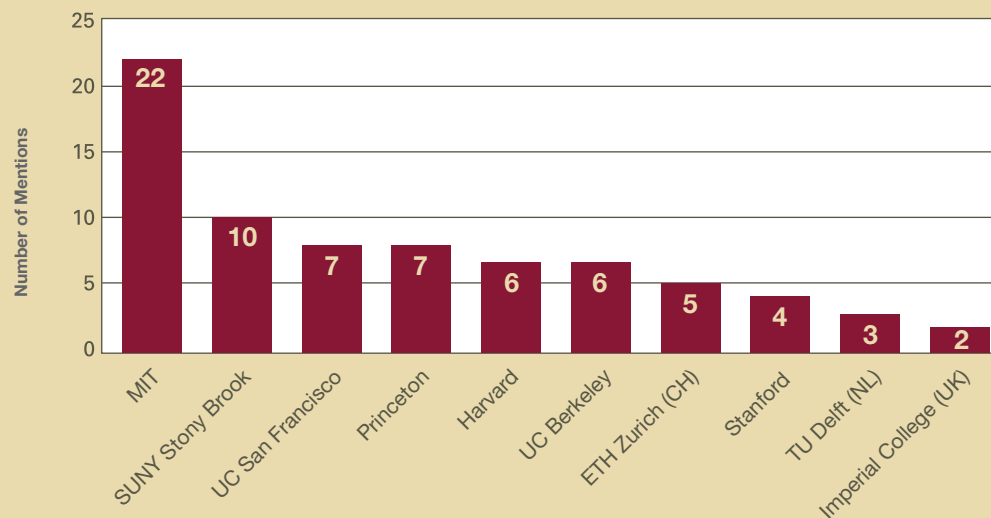


FIGURE 13: Top 9 Universities mentioned by European press (January 2003-January 2008)



Research Groups

Outside of universities or commercial laboratories, the analyses show that several groups were mentioned by both the European and American press as being involved in the development of synthetic biology. Most prominent was the J. Craig Venter Institute, which receiving almost five times as many mentions as the next most mentioned institute in the American press and nearly ten times as many mentions as the next most mentioned institute in the European press. Again, the American press focused almost exclusively on American institutes, while the European press mentioned both American and European institutes.

FIGURE 14: Research groups most mentioned by American press (January 2003-January 2008)

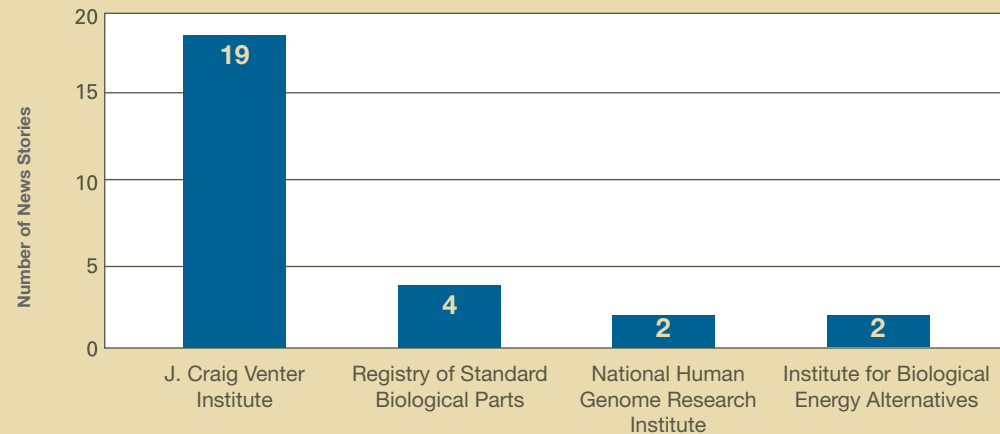
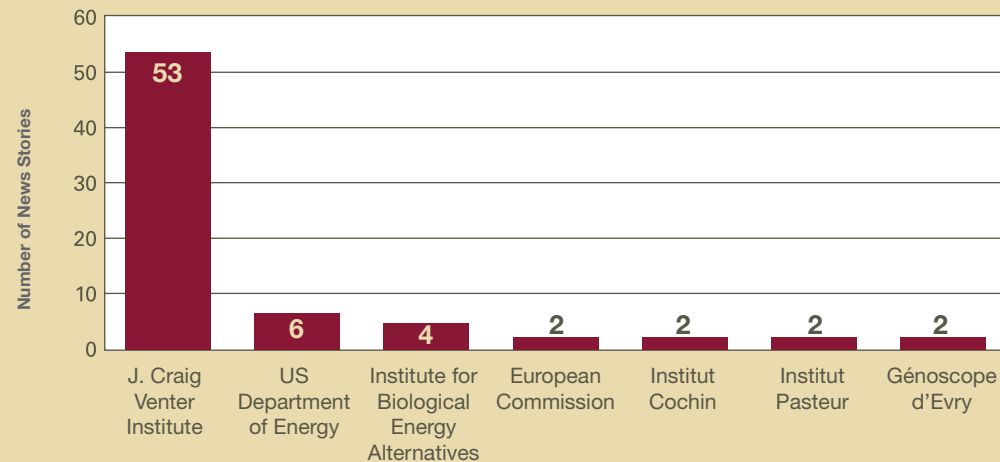


FIGURE 15: Research groups most mentioned by European press (January 2003-January 2008)



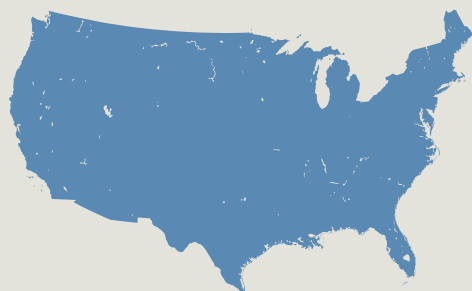
Question 3:

WHAT DOES THE PRESS COVER ABOUT SYNTHETIC BIOLOGY? HOW WAS SYNTHETIC BIOLOGY DEFINED AND FRAMED?

Definition of synthetic biology

While a comparison of the American and European press analyses reveals that there is no established international consensus on the definition of synthetic biology, both reports identified a heavy focus on the term *designer organisms* to describe synthetic biology. Also common in press definitions of synthetic biology is a reliance on engineering examples to describe the synthetic biology field. Both American and European press analyses show that metaphors such as “playing God” or “Frankenstein-like” were employed as well, but usually in reports emphasizing the potential risks of synthetic biology. As an element of convergence in the societal debate on synthetic biology, the expressions “playing God” or “copying God” are recurrent in the American and the European news stories. Some of the headlines of the American and European newspapers speak for themselves:

UNITED STATES



“As DNA research advances, science plays God ever more; New life forms — The line between biological and artificial is about to blur as life is synthesized in labs with man-made genetic material.” (*The Seattle Times*, December 24, 2007)

“Scientists enter brave new world of synthetic life” (*The Houston Chronicle*, December 17, 2007)

“Synthetic DNA on the Brink of Yielding New Life Forms” (*The Washington Post*, December 17, 2007)

“Seeing Earth’s future in a Petri dish; J. Craig Venter thinks genome design could create green jet fuel, gas—just about any chemical.” (*Los Angeles Times*, November 24, 2007)

“Genetic Engineers Who Don’t Just Tinker” (*The New York Times*, July 8, 2007)

UNITED KINGDOM



"It is life but not as God planned it" (*The Guardian*, April 1, 2004)

"Playing God: The man who would create artificial life" (*The Independent*, January 25, 2008)

"Man-Made Microbe 'To Create Endless Biofuel'" (*The Telegraph*, June 8, 2007)

"Test tube for 'Genome transplanter'" (*Financial Times*, June 28, 2007)

"Life is just a bowl of Petri" (*The Times*, July 2, 2007)

GERMANY



"Die Neuer findung des Lebens" – "The Reinvention of Life" (*Der Spiegel*, August 14, 2006)

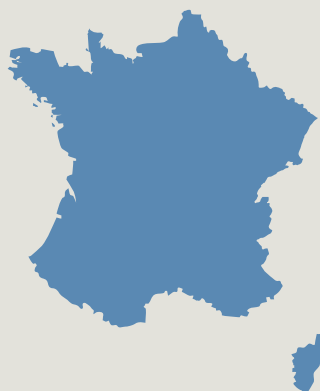
"Wunschtraum und Horrorvision – Craig Venter will die erste kunstliche Lebensform geschaffen haben." – "Great dreams and vision of horror – Craig Venter claims to be the first to have made synthetic life forms." (*Sueddeutsche*, March 16, 2008)

"Dr. Venter spielt Lego" – "Dr. Venter plays Lego" (*Frankfurter Allgemeine Zeitung*, January 27, 2008)

"Synthetisches Leben – Nano in Gottes Namen" – "Synthetic Life – Nano in the name of God" (*Die Zeit*, September 28, 2006)

"Auf neuem Weg zum Biosprit" – "On a new road to biofuel" (*Handelsblatt*, November 19, 2007)

FRANCE



“La vie inventée de toute pièces” – “Life invented from scratch” (*Le Monde*, January 24, 2008)

“Un pas vers la vie synthétique” – “A new step towards synthetic life” (*Libération*, June 29, 2007)

“La vie synthétique dans les éprouvettes des biologistes” – “Synthetic life in biologists’ test tubes” (*Le Monde*, June 30, 2007)

“Un club scientifique pour créer de nouvelles formes de vie” – “A scientific club to create new life forms” (*Le Monde*, January 13, 2008)

THE NETHERLANDS



“The Bacterie van Frankenstein” – “Frankenstein bacteria” (*NRC Handelsblad*, December 14, 2005)

“Kunsmatig leven verdient helder debat” – “Artificial life requires a stronger debate” (*de Volkskrant*, January 12, 2008)

“Nu doe-het-zelven ze al met dna” – “Now do-it-yourself with DNA” (*de Volkskrant*, February 2, 2008)

“Lego van DNA” – “Lego of DNA” (*NRC Handelsblad*, January 6, 2007)

Potential benefits and risks of synthetic biology

One of the potential benefits often associated with synthetic biology, as reported in the European and American press, is the development of biofuels that promise to be more efficient, cleaner and cheaper to produce than current fuels. Accordingly, many of the companies most mentioned, such as Amyris Biotechnologies, LS9 and Synthetic Genomics, among others, plan to develop and launch biofuels within a few years. Since these companies are based in the United States, the American public might also feel that this supply of fuel would be safer and less prone to disruption in quantity or price as a result of events that occur beyond U.S. borders.

Among the categories of potential risks posed by the development of synthetic biology, the American and European press primarily focus on physical harm. But while European press heavily report the unknown risks to the environment and public health related to newly created or modified organisms, the American press centers on security concerns revolving around accidental release or intentional misuse of the science. Ethical issues, such as concerns about “playing God” or creating “Frankenstein creatures,” are also being explored, as are intellectual property concerns involving the legal and moral implications of patenting life.

Calls for oversight

The American and European press also focused on several groups that have been calling for increased oversight and regulation of the emerging synthetic biology field. Initially, synthetic biology research was conducted by a few scientists at a select number of labs. However, as awareness of the field in the scientific community spread, so did the number of groups conducting research. Along with this increase in research came increased scrutiny by select civil society groups who felt that the research and its potential outcomes would be unethical or unsafe in some way unless properly regulated. However, as this realization was taking effect, the field of synthetic biology was already being researched on a global scale, prompting groups with global reach, such as Greenpeace and Friends of the Earth, to call for regulation. Of all groups calling for regulation, the Canada-based ETC Group received the most mentions in both the European and American press.



Question 4:

ARE THERE EMERGING DIFFERENCES IN HOW SYNTHETIC BIOLOGY IS COVERED IN THE UNITED STATES AND EUROPE?

Discrepancy on Coverage: Optimistic United States versus Precautionary Europe?

As figure 16 at right indicates, the European press analysis indicates the number of news stories mentioning potential benefits of synthetic biology outnumbered stories mentioning potential risk. Only 28 percent of the stories published by European press did not mention any potential risks. The ratio of European articles mentioning potential risks to potential benefits is about three-to-four. This reflects, to some degree, the European emphasis on the so-called precautionary approach, which emphasizes the need to invest in risk research of the concerned emerging technology and to promote public engagement at the early stage of the risk/benefit debate.

8. Because some European news stories mention both potential benefits and potential risks, the sum of potential benefits and potential risks is greater than the total number of European news stories returned in the study.

FIGURE 16: Percentage of news stories regarding synthetic biology in European press that mention potential benefits, potential risks, or both (January 2003-January 2008)

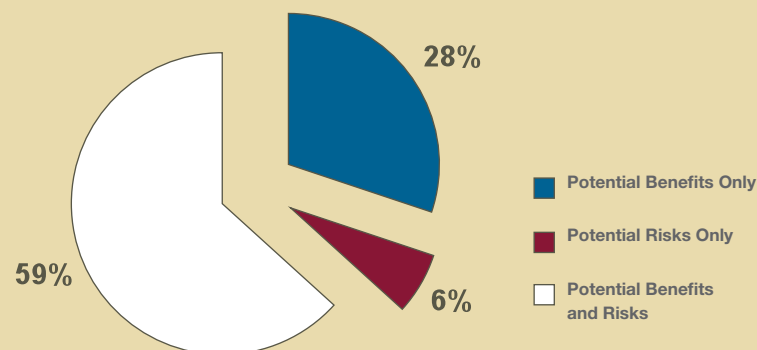
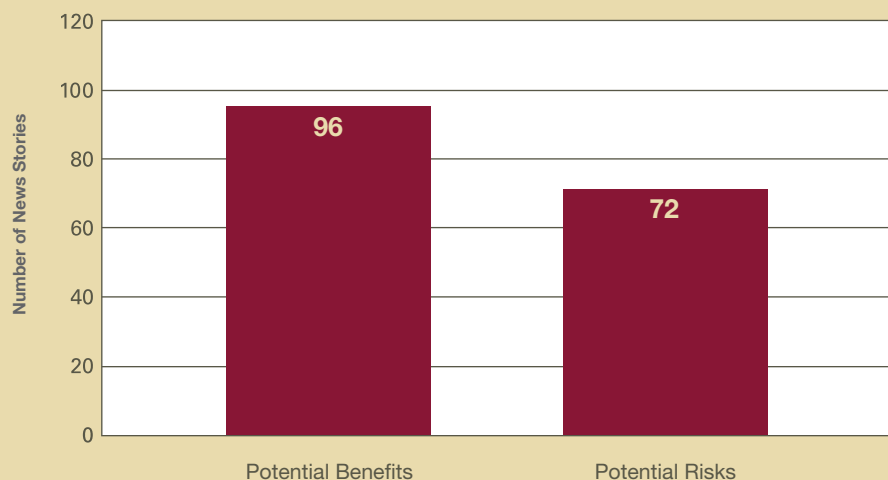


FIGURE 17: Number of news stories in European press that mention the potential benefits and risks of synthetic biology (January 2003-January 2008)⁸



The American press report shows that the number of news stories mentioning potential benefits of synthetic biology outnumbered stores mentioning potential risk, and that 51 percent of stories exclusively mentioned the potential benefits. The ratio of news stories mentioning potential risks to those mentioning potential benefits is more than a half. The more optimistic view on the potential of synthetic biology is in line with an approach that seeks to promote scientific and technological advances along with self-regulation and education of the public by the scientific community.⁹

9. For example, Parens, op. cit., p. 16-18.

10. Because some American news stories mention both potential benefits and potential risks, the sum of potential benefits and potential risks is greater than the total number of American news stories returned in the study.

FIGURE 18: Percentage of news stories regarding synthetic biology in American press that mention potential benefits, potential risks, or both (January 2003-January 2008)

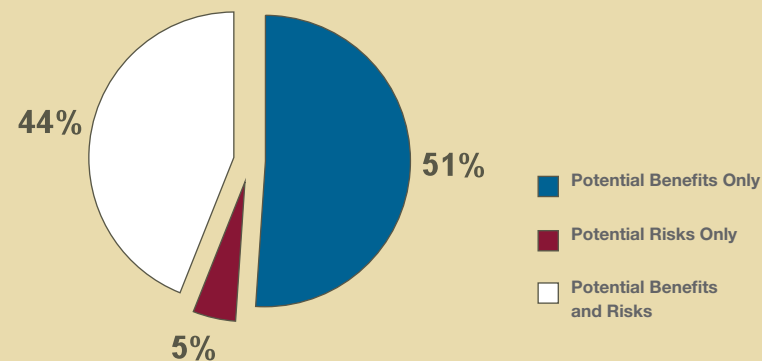
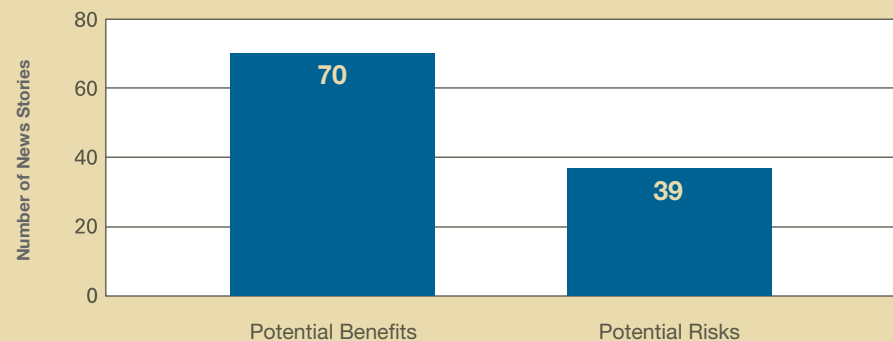


FIGURE 19: Number of news stories in American press that mention the potential benefits and risks of synthetic biology (January 2003-January 2008)¹⁰



Discrepancy on Which Potential Benefits and Risks Are Most Reported: Differences Between European and American Research Priorities?

The European press analysis indicates that the press favored environmental benefits such as more effective pollution cleanup, with potential environmental benefits receiving almost as much attention as potential energy benefits. However, the American press analysis indicates that the press gave the most attention to advances in health, such as cheaper, more effective drugs. Interestingly, potential energy benefits draw almost as much attention as potential health benefits in the American press.

11. Because most American articles mentioned more than one of the potential benefits of synthetic biology, articles may have been counted more than once when tallying individual news story mentions for each potential benefit.

12. Because most European articles mentioned more than one of the potential benefits of synthetic biology, articles may have been counted more than once when tallying individual news story mentions for each potential benefit.

FIGURE 20: Frequency of each potential benefit in American press (January 2003–January 2008)¹¹

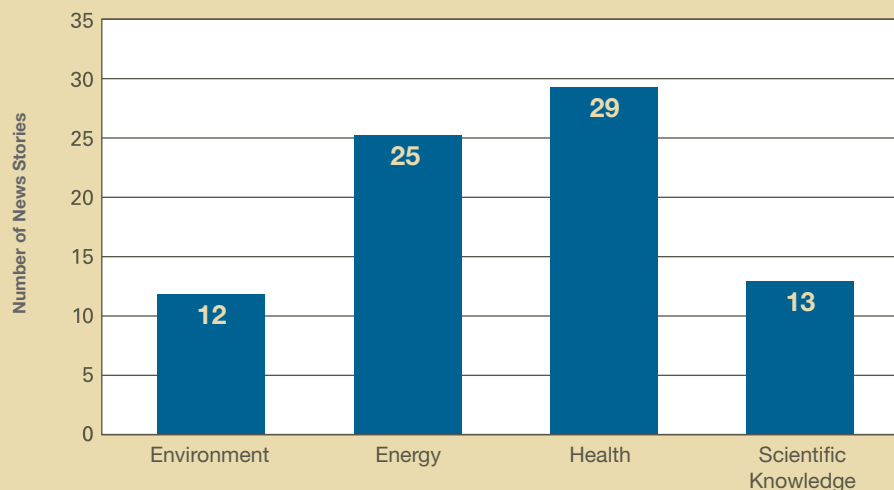
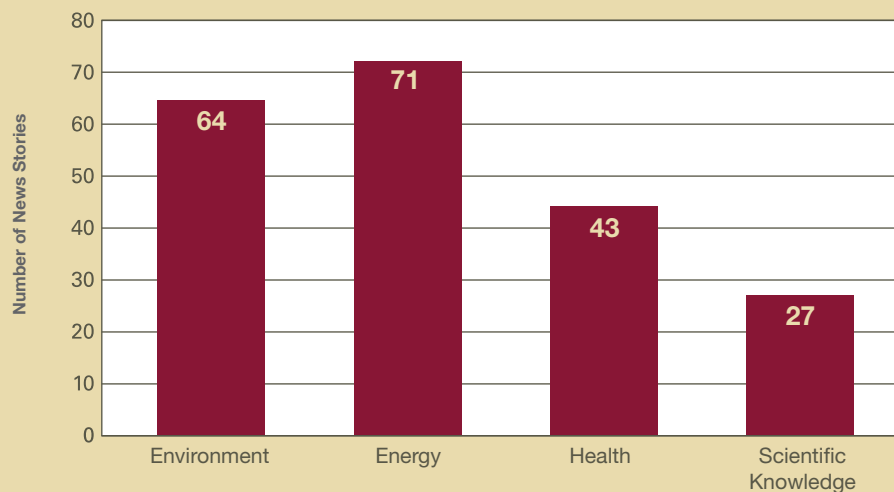


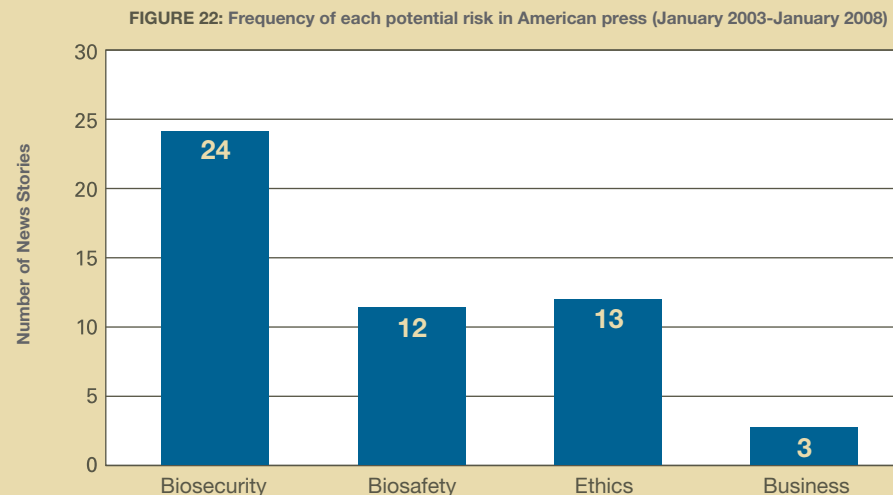
FIGURE 21: Frequency of each potential benefit in European press (January 2003–January 2008)¹²



It is difficult to pinpoint the reason for this discrepancy, but one explanation could be a difference in the respective priorities of the United States and European countries. This difference in priorities would then be reflected in what the media choose to cover more prominently. In a recent Eurobarometer¹³ poll of citizens in 30 European nations, climate change was seen as the second-largest problem facing the world; the spread of disease ranked sixth. In fact, in 23 of the countries polled, more than 50 percent of respondents mentioned climate change as the largest problem facing the world.¹⁴ Furthermore, 74 percent of respondents said that protecting the environment should be a priority for their country, even if it affected economic growth¹⁵. On the other front, numerous polls done in the run-up to the 2008 U.S. election have consistently found that more Americans choose health care than the environment as an extremely important or very important issue.¹⁶

When it comes to potential risks associated with synthetic biology, the American press was primarily focused on biosecurity risks such as bioterrorism, with ethical concerns coming in second and receiving approximately half as many mentions as biosecurity.¹⁷

13. Eurobarometer 69 – Public Opinion in the European Union – Spring 2008, Standard Eurobarometer 69/Spring 2008 – TNS Opinion & Social, Directorate General Communication, European Commission.
14. Ibid. p. 61.
15. Ibid. p. 59.
16. Based on polling data regarding the 2008 presidential election from Gallup, Pew and other polling entities as found on poll aggregator Polling Report at www.pollingreport.com/wh08.htm.
17. As with the potential benefits, there is significant overlap between the risks, as some American articles mention more than one potential risk of synthetic biology.

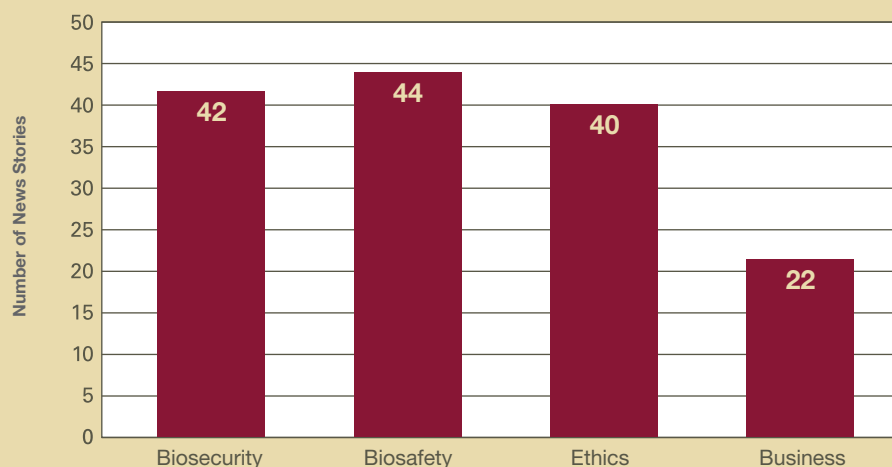


Biosecurity concerns are well reported in the American and European press. These results are in line with the current U.S. expert-driven debate, which has focused heavily on biosecurity issues.¹⁸ In American academia and industry, experts are already tackling issues such as standardization and self-regulation, focusing mostly on the prevention of bioterrorism.¹⁹ Interestingly, lower levels of biosecurity concerns are discernible among European experts.²⁰ The European press largely reports on biosecurity as one potential source of risk. As a matter of interest, the UK newspaper *The Guardian* conducted its own investigation demonstrating that it is possible to place an order for DNA sequences of any potential pathogen without proving a socially legitimate rationale for the research. “In our case, VH Bio Ltd did not realize it was supplying part of the smallpox genome, but many scientists argue that it is the responsibility of companies selling custom-made pieces of DNA to check their orders for potentially dangerous sequences.”²¹ *The Guardian's* investigation has led to rising attention on biosecurity concerns and calls for regulation of DNA-synthesis companies.

The European press analysis indicates that the European press was almost equally concerned about biosafety (accidental releases), biosecurity and ethics. However, biosafety concerns were accorded the most attention by European news stories. Interestingly, the European press devoted a substantially larger amount of attention to concerns of “big business” dominance of the field.

18. Selgelid, M., “The tale of two studies: Ethics, Bioterrorism and the Censorship of Science”, Hastings Center Report 37, n. 3:35-43, 2007; Tucker, JB., Zilinska, RA., “The Promise and Perils of Synthetic Biology”, *The New Atlantis*, Spring 2006, p. 25-45; Bhutkar, A., “Synthetic Biology: Navigating the Challenges Ahead”, *J. BIOLAW & BUS.*, Vol. 8. n. 2, 2005, p. 19-29.
19. Garfinkel, M., Endy, D., Epstein, GL., Friedman, RM., *Synthetic Genomics – Options for Governance*, 2007.
20. Kelle, A., “Synthetic Biology and Biosecurity Awareness in Europe”, *Bradford Science and Technology Report* n. 9, November 2007.²¹ *The Guardian*, June 14, 2006.
22. As with the potential benefits, there is significant overlap between the risks, as some European articles mention more than one potential risk of synthetic biology.

FIGURE 23: Frequency of each potential risk in European press (January 2003-January 2008)²²



In the European press coverage, the potential of biosafety risks appears in the majority of news stories as the most crucial concern. From the present results and from past debates over the biosafety of genetically modified (GM) crops, it is possible to envision future discussions on the implications of synthetic biology in Europe placing a heavy focus on biosafety. Much as other strategic technologies such as genetic engineering or nanotechnology do, synthetic biology ultimately raises the question of assessing the biosafety risks of complex and often unpredictable novel materials.

Ethical issues may also play a major role as synthetic biology develops. In the European press, news stories focus on the blurred distinction between the “artificial” and the “natural,” the instrumental approach toward life and, finally, the issue of “creating life” as the ultimate form of control over nature.

Discrepancy in Media Coverage of Synthetic Biology Actors

When it comes to reporting on groups conducting research on developing or commercializing synthetic biology, universities and institutes conducting research on

developing or commercializing synthetic biology, the American press focuses on American companies, universities or organizations while European press tends to report on both European and American groups. While this discrepancy may be interpreted as a bias by American press in favor of U.S. institutions or against European institutions, it is more likely caused by the historical development of the field.

As mentioned earlier, important events such as the International Conference on Synthetic Biology meetings were initially held in the United States and were hosted by American universities. Not until 2007 was the International Conference on Synthetic Biology held outside the United States, in Zurich. The hosting of the conferences also highlights the leading universities and regions in the United States where synthetic biology research is most prevalent, specifically the greater Boston and San Francisco Bay areas. Many of the universities most mentioned by the American and European press are located in these areas (MIT, Harvard University and the University of California, Berkeley) as well as many of the companies and institutes that these universities have spawned. In the near



future, it is likely that the European press will report on these American pioneers as well as the “home-grown” institutions that are undertaking synthetic biology research within the European Union (EU).

“If Synbio is to deliver it will need broad public support and that will require much more engagement than has happened to date.”

-MARK HENDERSON “TIME TO CONVINCE THE PUBLIC”, *THE TIMES*, OCTOBER 27, 2007.



A Research Agenda for Synthetic Biology

Improve assessment of public perceptions toward synthetic biology

In the short term, public awareness and understanding of synthetic biology will be influenced by press coverage of the field. The way synthetic biology is portrayed in the press offers insights into how both supporters and opponents of the field wish to frame the issues associated with its development. In the long term, a large scale transatlantic study of public perceptions is needed to understand what applications of synthetic biology would be welcome by the public and which risks would prove unacceptable for society at large. Assessing the societal utility associated with various applications of synthetic biology would help inform on-going and planned discussions on governance.

Promote a transatlantic perspective on the risks of synthetic biology

As revealed by both analyses, there is a distinct difference in the way the potential risks of synthetic biology are presented to the American and European publics. The current focus of the American press on biosecurity issues and of the European press on biosafety and environmental impacts may lead to different opinions concerning the risks and potential regulation of the field.

Given the current prominence of U.S. research in the development of synthetic biology and growing importance of European research, it would be fruitful to develop a transatlantic perspective on, and approach to, risk assessment and management.

Increase public engagement linked to synthetic biology

Both the European and American press analyses show that ethical and societal issues are prominent in the coverage of synthetic biology. Discussion of these issues cannot be limited to small groups of elites. Broader public engagement on these implications of synthetic biology should begin now.

“One lesson of issues such as GM crops is that ordinary people do not always think like philosophers, especially on subject as sensitive as the creation of life. A backlash may be irrational, but it could still threaten a promising field.”

-MARK HENDERSON “TIME TO CONVINCE THE PUBLIC”, *THE TIMES*, OCTOBER 27, 2007.



Methodology

The data in this report were taken from two separate reports written on media trends in coverage of synthetic biology in the United States and Europe between January 2003 and 2008, respectively. The data presented in the introduction to this report originally appeared in the individual reports that can be found in the accompanying two appendices. Brief descriptions of the methodologies employed in the two reports follow, but for a full description of the data collection and analysis techniques for those reports, please see their respective study methodologies.

The American press coverage report is based on a LexisNexis search covering major U.S. newspapers and transcripts between January 11, 2003, and January 29, 2008, that mention “synthetic biology.” The original search queries returned 134 results; however, some of these results were omitted from the dataset because they did not address the topic of synthetic biology in any detail or because they were duplicates of other articles, leaving 88 relevant news stories, 76 of which are unique. While the stand-alone report on the American press uses these data, only the

data taken from the 65 newspaper articles returned by the LexisNexis search were used for the purposes of this overview report in order to more accurately draw parallels with the European report, which focused exclusively on newspaper stories. The names of universities, organizations, companies, government agencies and institutions involved with synthetic biology, as well as descriptions of the technology and its potential benefits and risks, were compiled using these articles.

The European press coverage report is based on the result of systematic, multilingual²³ search for the term “synthetic biology” in major newspapers published in seven European countries between January 1, 2003, and January 29, 2008. The original search queries returned 112 results. Several aspects, such as the definition of the technology, the benefit/risk ratio, the call for and the proposed oversight measures as well as the actors involved (e.g., universities, companies, institutions) were identified in the articles and then analyzed and translated into diagrams.

23. The report collected articles in English, French, Dutch, German, Spanish and Italian.

The selection of the seven European countries covered in the report is based on the SYN BIOLOGY report,²⁴ which identified the UK and Germany as the two significant contributors to synthetic biology research, followed by “medium-contribution” countries such as the Netherlands, France, Spain and Switzerland. Italy was included in the report because it was identified as a “lower contributor” to synthetic biology research. The variance between “significant” and “medium-contribution” countries, as evidenced by the SYN BIOLOGY report, also applies to the press coverage analysis. As a result of systematic search for news stories about synthetic biology, it is worth noting that the UK and Germany offer the broadest coverage, which correlates to high research output in synthetic biology, with 35 percent of research articles published by Germany and 20 percent of research articles published by the UK.²⁵

With respect to the other countries, in particular France, Spain, Switzerland and Italy, the search for news stories has yielded comparatively fewer results than for the UK or Germany. In the case of the UK and Germany, the study relies on a selection of six major newspapers representing the diversity of the political spectrum. For the remaining five countries (the Netherlands, France, Spain, Switzerland and Italy), two top newspapers each were used to analyze the press coverage. Because each nation and newspaper approaches emerging technologies differently, there is no real unified European media. The study favors a qualitative approach and aims at giving a substantial sample of the European press coverage of synthetic biology.

24. SYN BIOLOGY, *An analysis of Synthetic Biology Research in Europe and North America*, Final Report on Analysis of Synthetic Biology Sector, September 2006, Deliverable D11, FP6-2003-NEST-B4 Project 015357, p. 38.

25. Ibid

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The **Synthetic Biology Project** was established in August 2008 at the Woodrow Wilson International Center for Scholars. The Project aims to foster informed public and policy discourse concerning the advancement of synthetic biology – an emerging interdisciplinary field that uses advanced science and engineering to make or re-design living organisms, such as bacteria, so that they can carry out specific functions. Synthetic biology involves making new genetic code, also known as DNA, which does not already exist in nature.

Work of the Synthetic Biology Project is support by a grant from the Alfred P. Sloan Foundation. For more information about the Project visit: www.synbioproject.org

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