

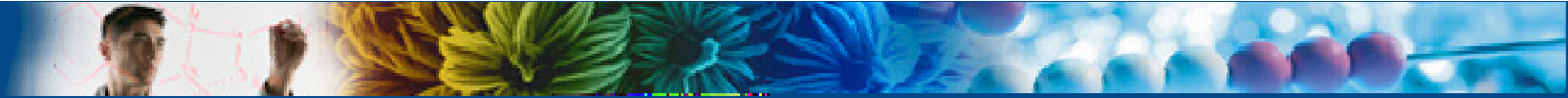
Awareness & Impressions of Synthetic Biology

Key findings from a survey among 804 adults nationwide
Conducted January 2013

for

Synthetic Biology Project
The Woodrow Wilson International Center for Scholars

Margin of error = ± 3.5 percentage points among all adults

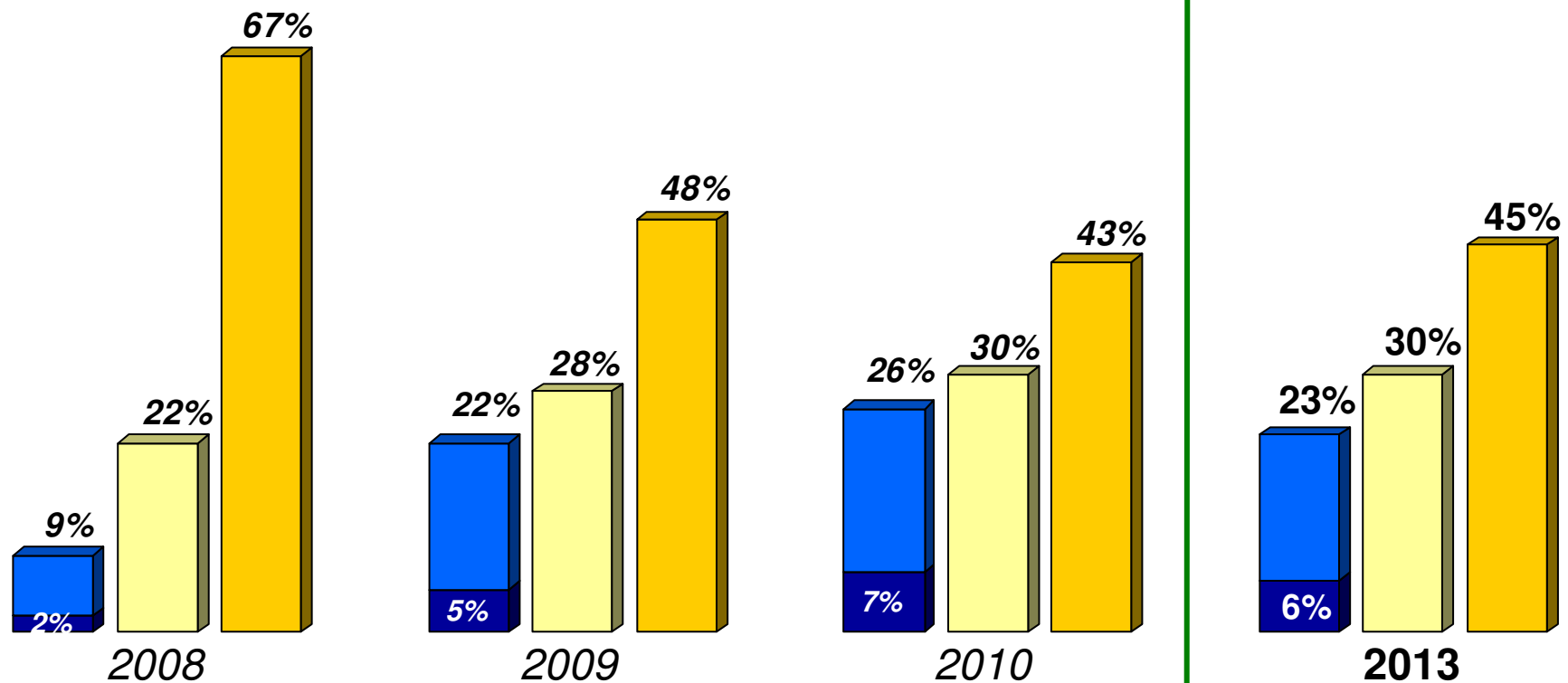




Public awareness of synthetic biology has held steady.

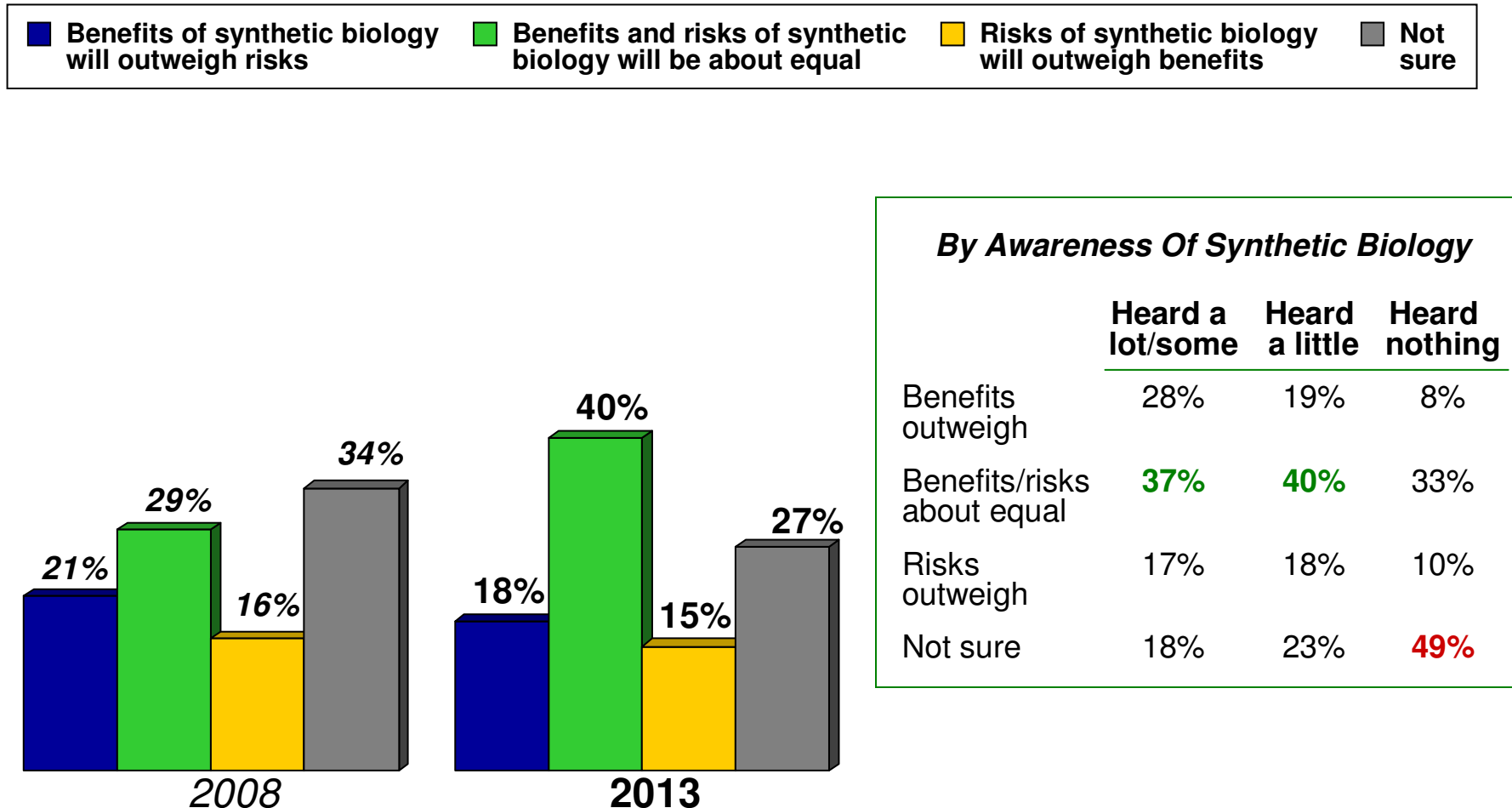
How much have you heard about synthetic biology?

■ Heard a lot ■ Heard some ■ Heard just a little ■ Heard nothing at all





Initially, a plurality thinks that the risks and benefits of synthetic biology are about equal.





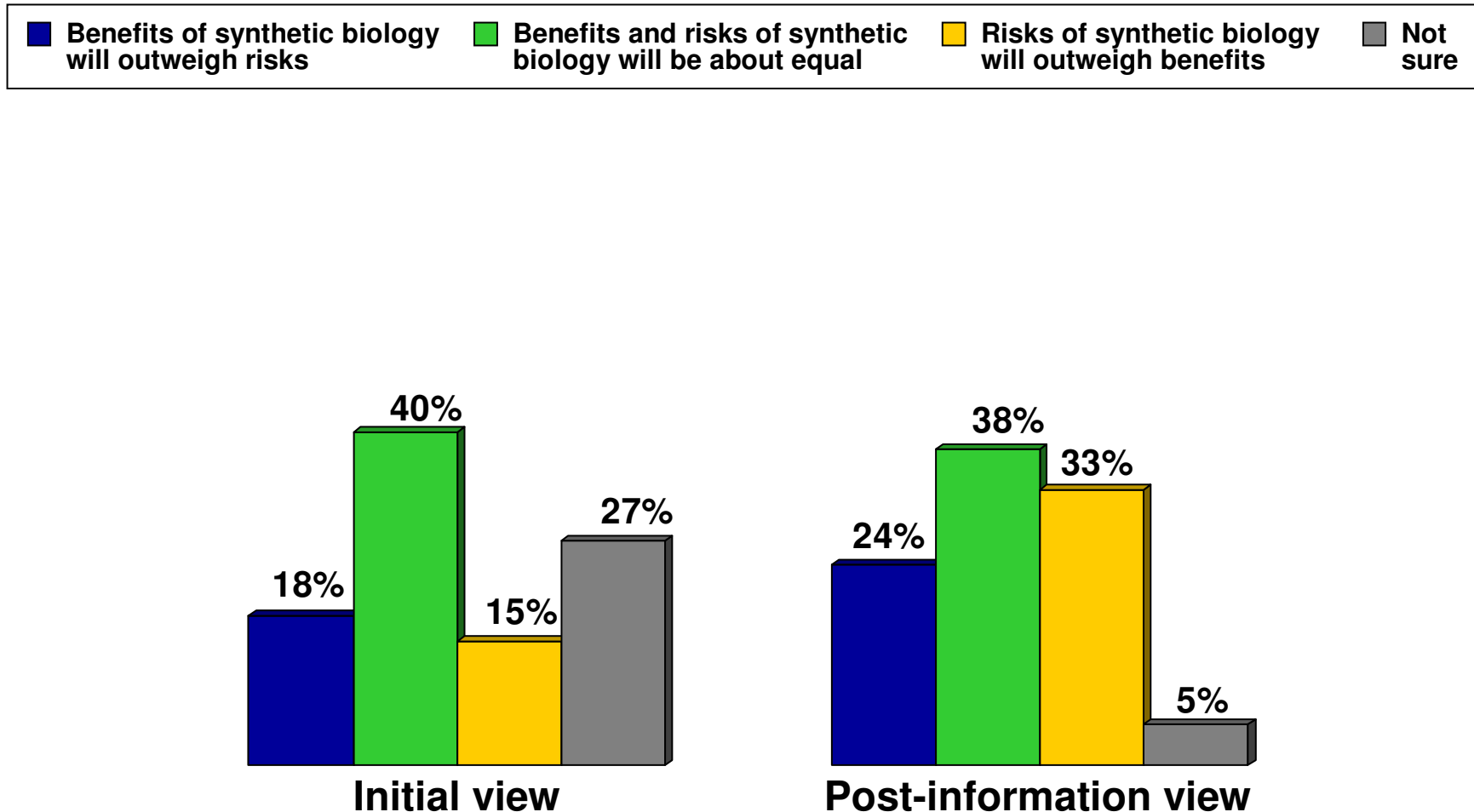
Description Of Synthetic Biology Given To Respondents

Synthetic biology is the use of 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, that does not already exist in nature.

The potential **BENEFITS** of synthetic biology include developing new micro-organisms to treat disease, including cancer, more effectively and to create new and less expensive medications. It also could be used to make new organisms that could provide cheaper and cleaner sources of energy than today's oil-based fuels, and to detect and break down environmental pollutants in the soil, air, and water.

While the potential **RISKS** of synthetic biology are not known, there are concerns that man-made organisms might behave in unexpected and possibly harmful ways and that they could cause harm to the environment. There also are concerns that, if these organisms fall into the wrong hands, they could be used as weapons. Additionally, the ability to create artificial life has raised moral and ethical questions about how life is defined.

After learning about synthetic biology, more move toward concern about risks than toward optimism about benefits.



Initial/Informed Impressions Of Risks/Benefits Of Synthetic Biology, *Among Key Subgroups*

	Initial Impression			Informed Impression		
	Benefits outweigh	Equal	Risks outweigh	Benefits outweigh	Equal	Risks outweigh
All adults	18%	40%	15%	24%	38%	33%
Men	26%	36%	13%	31%	35%	30%
Women	11%	43%	18%	18%	41%	35%
Age: 18 to 34	19%	45%	13%	26%	44%	27%
Age: 35 to 49	18%	39%	16%	28%	36%	32%
Age: 50 to 64	18%	35%	23%	21%	36%	38%
Age: 65 and over	14%	37%	10%	23%	38%	30%
High school/less ed	11%	49%	13%	18%	35%	38%
Some college/tech ed	16%	39%	18%	21%	42%	34%
College graduate/more	24%	33%	16%	32%	38%	27%
Income: under \$30K	11%	45%	13%	18%	43%	33%
Income: \$30K to \$50K	16%	45%	18%	20%	43%	30%
Income: \$50K to \$75K	24%	41%	19%	35%	31%	32%
Income: over \$75K	28%	35%	15%	32%	35%	32%

Initial/Informed Impressions Of Risks/Benefits Of Synthetic Biology, *Among Key Subgroups*

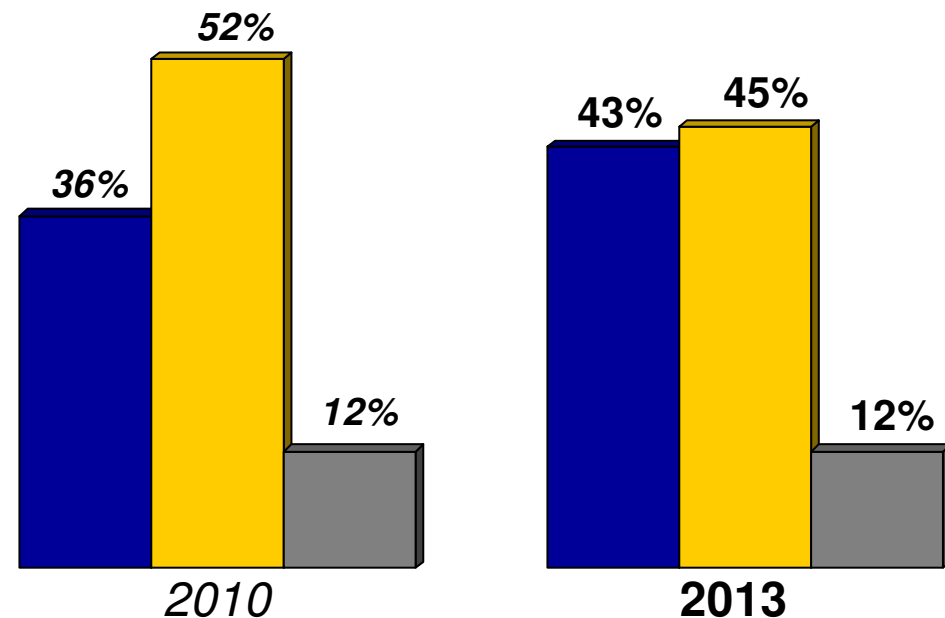
	Initial Impression			Informed Impression		
	Benefits outweigh	Equal	Risks outweigh	Benefits outweigh	Equal	Risks outweigh
All adults	18%	40%	15%	24%	38%	33%
Whites	19%	36%	17%	27%	36%	33%
African Americans	15%	45%	12%	19%	47%	30%
Hispanics	13%	51%	8%	17%	47%	30%
Attend religious services:						
Weekly	14%	40%	20%	19%	34%	42%
Occasionally	21%	43%	12%	28%	44%	26%
Rarely/never	19%	37%	16%	29%	38%	26%
Evangelicals	17%	41%	16%	19%	34%	43%
Initial familiarity with synbio:						
Heard a lot/some	28%	40%	19%	34%	37%	27%
Heard just a little	19%	44%	19%	29%	33%	34%
Heard nothing	11%	37%	12%	18%	42%	34%



The public today is divided over voluntary guidelines versus government regulation of synthetic biology.

Which best describes your point of view on voluntary research guidelines for synthetic biology research?

- Voluntary research guidelines developed jointly by industry and government can provide adequate oversight of synthetic biology research.
- Synthetic biology research should be regulated by the federal government because voluntary research guidelines developed jointly by industry and government cannot provide adequate oversight of synthetic biology research.
- Not sure



Voluntary Guidelines Vs. Government Regulation, Among Key Subgroups

*Which comes closer to your point of view
on regulation of synthetic biology research?*

	Voluntary guidelines	Gov't regulation		Voluntary guidelines	Gov't regulation
All adults	43%	45%	Democrats	31%	60%
Men	48%	41%	Republicans	56%	32%
Women	37%	49%	Independents	45%	39%
High school/less ed	38%	49%	Confidence in federal government to maximize benefits/minimize risks:		
Some college/tech ed	44%	46%	Great deal/fair amt	33%	59%
College graduates	45%	41%	Just some/little	49%	38%
Whites	47%	41%	Confidence in business to maximize benefits/minimize risks:		
African Americans	32%	58%	Great deal/fair amt	47%	43%
Hispanics	30%	57%	Just some/little	39%	48%
Income: under \$30K	35%	55%			
Income: \$30K to \$50K	46%	42%			
Income: \$50K to \$75K	44%	42%			
Income: over \$75K	48%	41%			



Moving Forward Vs. Banning Synbio Research, Among Key Subgroups

Which best describes your point of view on synthetic biology research?

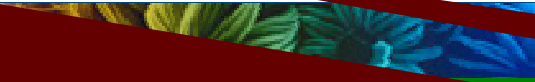
	Move forward	Ban research		Move forward	Ban research
All adults	61%	34%	Churchgoing/religion:		
Men	65%	30%	Attend svcs weekly	54%	40%
Women	57%	38%	Evangelicals	49%	47%
High school/less ed	48%	47%	Informed support for synthetic biology:		
Some college/tech ed	60%	33%	Benefits outweigh	88%	12%
College graduates	72%	24%	Risks/benefits equal	68%	26%
Whites	66%	30%	Risks outweigh	34%	61%
African Americans	46%	48%			
Hispanics	46%	47%			
Income: under \$30K	50%	46%			
Income: \$30K to \$50K	62%	34%			
Income: \$50K to \$75K	73%	25%			
Income: over \$75K	70%	26%			





Reminder of Varied Reactions To Applications In 2010 Survey

■ Positive development/I would be hopeful ■ Negative development/concerns me



Majorities see other applications as negative developments.

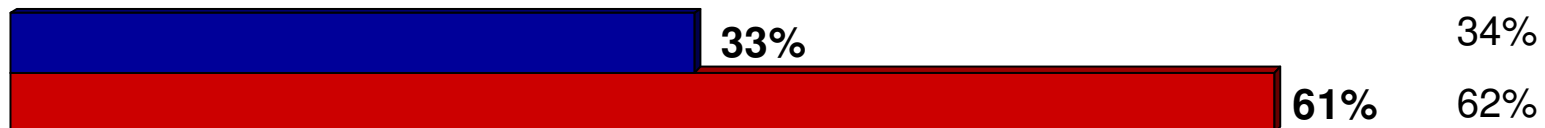
■ Positive development/I would be hopeful ■ Negative development/concerns me

New fertilizer that speeds up root growth in crops: Synthetic biology is used to change the genetic code of bacteria that occurs naturally in the soil so that it releases a growth hormone that is then absorbed by the plant, causing it to quickly grow stronger roots that help prevent soil erosion and protect the plant during a drought.

*By
Informed View:
Risks/benefits
about equal*



New food additives: Including an artificial sweetener, a vanilla flavoring, and a citrus flavoring, rather than using crops or other natural resources to manufacture these food additives, they can be produced synthetically by bacteria.





Impressions Of Potential Applications Of Synthetic Biology, *Among Key Subgroups*

	Synbio in Fertilizer		Synbio in Food Additives	
	Positive development	Negative development	Positive development	Negative development
All adults	41%	52%	33%	61%
Men	53%	41%	46%	48%
Women	30%	62%	22%	73%
High school/less ed	38%	55%	26%	70%
Some college/tech ed	39%	56%	35%	59%
College graduate/more	44%	47%	37%	56%
Churchgoing/religion:				
Attend weekly	33%	62%	25%	68%
Attend occasionally	48%	44%	37%	59%
Evangelicals	27%	71%	28%	70%
Informed support:				
Benefits outweigh	62%	34%	68%	27%
Risks/benefits equal	47%	46%	34%	62%
Risks outweigh	17%	77%	13%	83%



In Their Own Words: How The Public Thinks

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In Their Own Words: How The Public Thinks About The Risks Of Synthetic Biology

From Focus Groups Conducted In 2011

“We can sit and think about what sort of life form we'd like to make and design it like a car, we could alter nature and guide human evolution, we can put it in a microbe and two weeks later, out comes your product? Those are all very, very scary thoughts that somebody has that power.”

“I'd like to see more guarantees because, like I said before, you can't control nature. You know, it might be synthetic, but you're creating an organism, you know what I mean, it's going to do what it pleases.”

“I think that history's paved with the best intentions and that all of these arguably are phenomenal advancements, but there are no safeguards and there is no clean understanding as to what the negative repercussions are and I don't know if there ever would be. I don't think that there's ever going to be a failsafe mechanism to know what happens if this is given to the wrong people or with people who have solely profit in mind, and the ends justify the means in their world and to hell with anything else that comes along with it. It's concerning and I look at it with more of a critical eye.”

“I would say if there's not someone in their group that's constantly questioning ‘*Should we be doing this?*’ then they need to expand their group to include that person.”

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