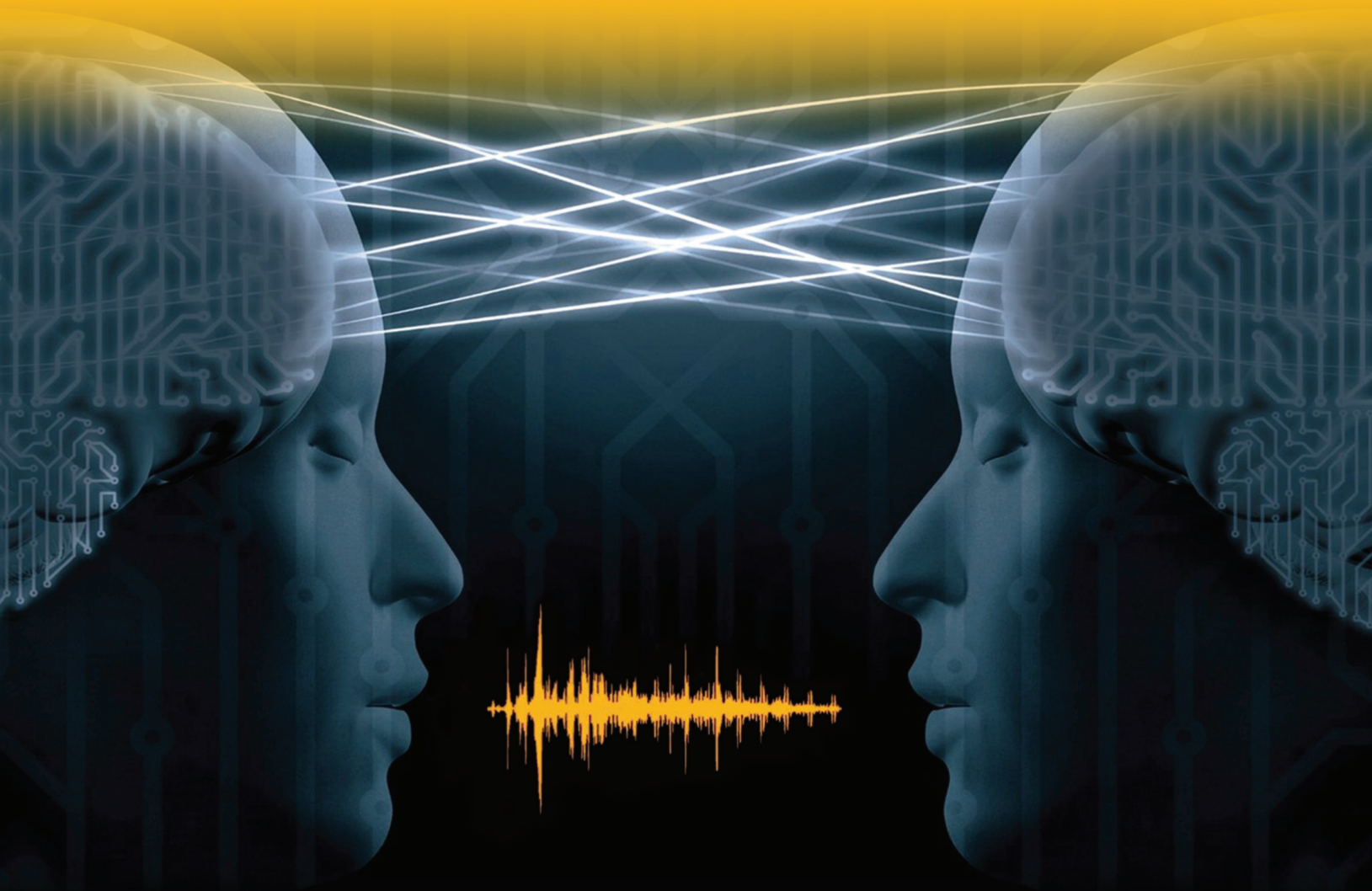
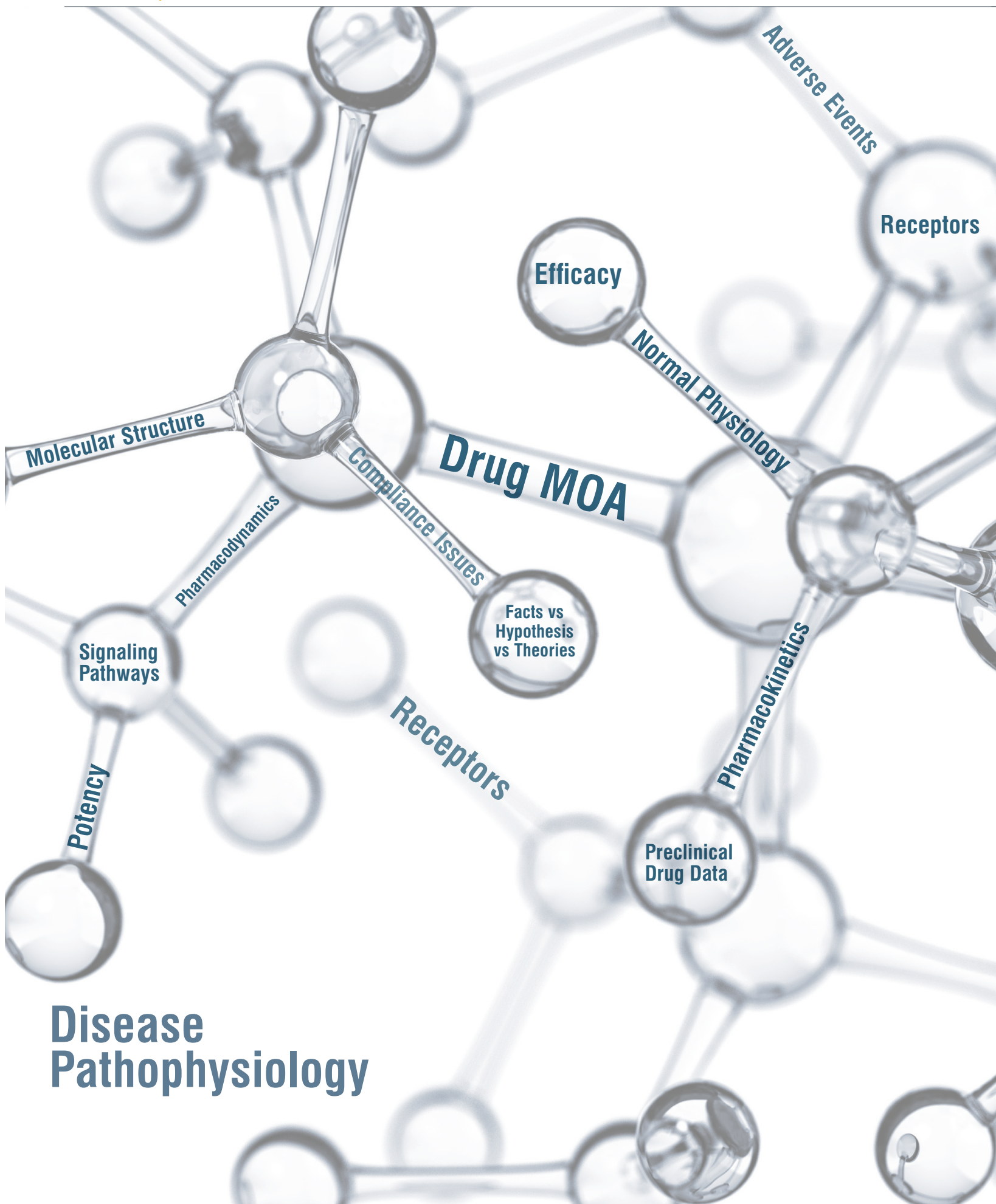


# **The Power of a Scientific Story**

*Why Storytelling Beats the Dull Lecture*

Edward J. Perper, MD





# Because Boredom Kills

When it comes to prescribing behavior, does science matter to practicing healthcare professionals (HCPs)? Does the science influence their choice of one compound versus another? Does it make it more or less probable that they'll treat or not treat a particular patient?

Some people say no. HCPs don't care about your compound's mechanism of action. All they care about is the clinical efficacy and safety data, they say.

## **But maybe that's just plain wrong.**

The truth is that science, when presented in a compelling and comprehensible manner, can electrify an audience. Let's remember that HCPs are professional biologists who practice the art of medicine. Science is fascinating and important to many of them, perhaps even most.

Here's the real problem: Science is often presented in flat boring lectures that go on too long and contain too much detail. That turns people off and gives the impression that the audience is not interested in the science. The truth is that when science is presented in a compelling fashion, people—including healthcare professionals and scientists—are turned on.

Communicating how and why a novel compound works is, of course, no easy task. But given the extraordinary hurdles required to get a drug approved and to market, new product planners and medical affairs executives should do whatever it takes to communicate the excitement and benefits of their new drug's science in the most concise, compelling and memorable way possible.

Unfortunately, it cannot be overemphasized that the most common communication method used by pharmaceutical companies remains a remnant of medical school teaching—the dull lecture.

## **Conventional Scientific Communication Often Fails—And We Know Why**

The vast majority of pharmaceutical science programs are flat, dull, boring lectures. They typically follow a highly predictable sequence: unmet need, epidemiology,

pathophysiology, MOA, preclinical data, clinical data, summary. Your internal and external audiences have seen that exact sequence hundreds of times. Not surprisingly, the typical response, more often than not, is to tune out.

For instance, researchers from the University of Washington and University of Maine—in the largest and most comprehensive study of science/technology education ever published—found that students in classes with traditional stand-and-deliver lectures were 50% more likely to fail than students in classes that used more stimulating, active learning methods. In a review of this study in the journal *Science*, Harvard University physicist Eric Mazur said: “The impression I get is that it's almost unethical to be lecturing if you have this data.”

Although there are exceptions, the vast majority of lecture-based presentations are riddled with problems that make them dull and boring:

- They're too long
- They lack a cohesive narrative
- They depict overly complex data
- They use graphics that are too dense or poorly designed

This is why flat, dull lectures fail to engage and move audiences.

The consequences are serious: presentations fail to capture attention, they fail to educate, and most importantly, they fail to excite both internal and external stakeholder audiences about the new compound.

When key stakeholders, especially physicians, can't easily understand the science of your compound—how and why it works and why it's more effective than others—they don't differentiate it from competitors, they won't get excited about it, and they'll be less compelled to enroll patients in clinical trials or prescribe your drug appropriately once it's approved.

What then is the best approach to communicating new and complex science in a compelling, intuitive and unforgettable way?



# The TED Revolution: Story-Based Talks

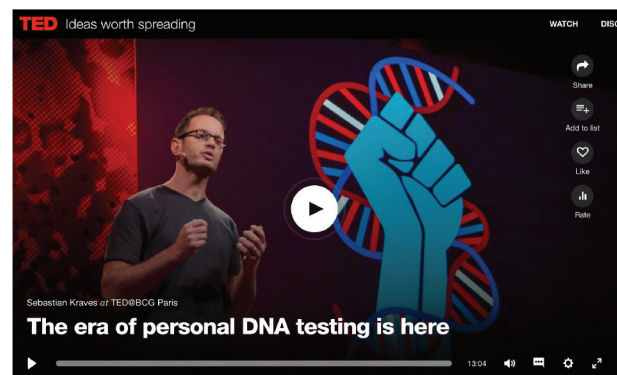
Chris Anderson, who founded TED, said, “Unlike challenging explanations or complex argument, everyone can relate to stories... Done right, a talk can electrify a room and transform an audience’s worldview.” TED talks cover a wide variety of topics, but scientific talks are very common. The TED approach to communication has clearly shown that even highly scientific subjects can be compelling, fascinating—even riveting.

Yet many in the pharmaceutical, medical and scientific communities don’t appreciate, or are not even aware, that communicating science through story is possible for their own science.

There are currently 575 science talks on TED. Many of them have gone viral. A few examples:

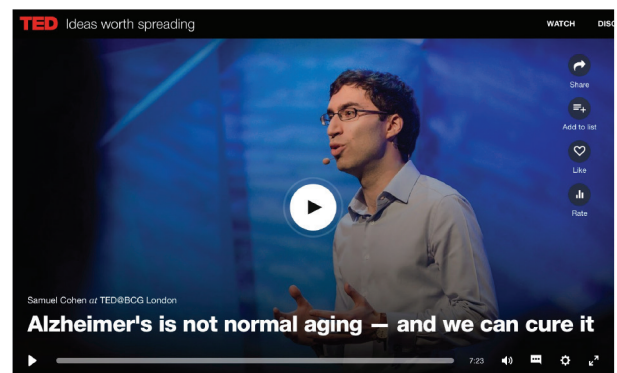
- “What is so special about the human brain?”  
– **2.9 million views**
- “We can hack our immune cells to fight cancer”  
– **1.3 million views**
- “Is the obesity crisis hiding a bigger problem?”  
– **3.9 million views**
- “Alzheimer’s is not normal aging and we can cure it”  
– **2.3 million views**
- “A better way to harvest bone marrow”  
– **517,000 views**
- “Understanding cancer through proteomics”  
– **459,000 views**
- “The era of personal DNA testing is here”  
– **1.1 million views**

Typical flat video lectures on the internet are seen by far fewer people. Why are TED’s science talks so popular? We believe it is because storytelling is powerful. All TED speakers, including internationally renowned scientists and experts, are not permitted to give their conventional lecture-based presentations. They are coached and assisted in developing their own story-based presentation.



Sebastian Grave  
TED@BCG Paris 2016

**1.1 million views**



Samuel Cohen  
TED@BCG London 2015

**2.3 million views**

# The Power of Scientific Story

## Why do stories have such an impact?

Peter Guber, CEO of Mandalay Entertainment, expanded on this in his book *Tell to Win*: “If a story is well told, both teller and audience will remain in [an optimal mental state] right through to their shared ‘ahha!’ when the teller’s original epiphany is experienced by the listener as his or her own eureka.”

In *Knowledge and Memory: The Real Story*, Roger Schank of Northwestern University and Robert Abelson of Yale University suggested that virtually all human knowledge is based on stories constructed around past experiences, that new experiences are interpreted in terms of old stories, and that “Storytelling and understanding are functionally the same thing.”

Dr. Marco Iacoboni, Professor of Behavioral Science at UCLA, an expert on the neuroscience of human communication points out that, “Evolution shaped our brains to learn through story”. In fact, neuroscientists have found that storytelling has specific and powerful effects on the brain and that our brains react differently when we’re told a story than when we’re fed lists of facts and data.

During conventional communication, the two parts of the cerebral cortex linked to speech are activated, decoding words into meaning. However, when we’re told a story, other areas in our brain that we would use when experiencing the events of the story are also activated. In fact, the brains of people listening to a story are activated similarly to those of the person telling the story, almost as if they were experiencing the event themselves.

See box: “The Neurobiology of Story” on page 11.

## What do we mean by “story” ?

To most people, the word “story” means a recounting of events—something that happened to someone over time. We refer to these as the “little story”. What we call the “big story” has a bigger arc and a broader and deeper message.

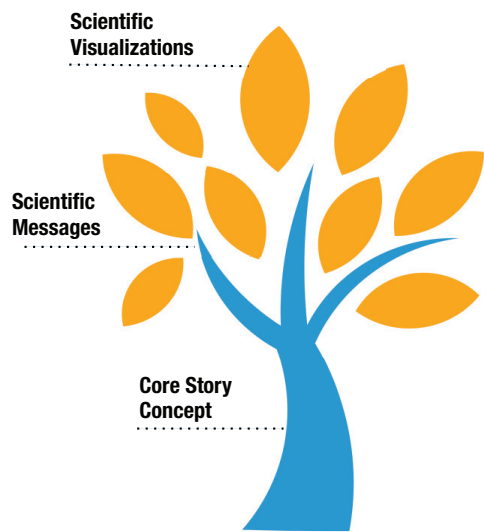
A little story can be very powerful and very effective—and can in fact be part of a big story—but it doesn’t necessarily address or convey the full scope and breadth of the big story. The big story, on the other hand, delivers the big scientific idea—what we refer to as the Core Story Concept (see next page)—the take-home point that audiences will care about and share with others.

# The Role of Story Structure and Story Flow

What makes a scientific story compelling and memorable? Critical to a story’s success is that it must have both *the right structure* and *the right flow*.

## Scientific Story Structure

By “structure,” we mean the *components* of a powerful story. Most importantly, there must be a clear and powerful “big idea”—a major theme that is easy to understand and around which the story is developed—what we call the Core Story Concept. The structure also includes two other elements: carefully developed scientific messages and scientific visualizations. A simple analogy for the right story structure is a tree (see illustration).



While a compound’s mechanism of action (MOA) is clearly a key element of its story, the MOA is not synonymous with the scientific story. In our experience, programs that focus only on the MOA and clinical data don’t leverage the true potential of a well-crafted scientific story.

On the flip side of providing too little information is providing too much. While the “scientific platform”—which contains essentially everything that is known about the drug and disease science—is a critical internal document, it’s not a useful asset for communicating a concise, compelling, powerful story to your target audiences. This is because in addition to lacking story structure a massive scientific platform document overwhelms audiences with too much information.

	LECTURE-BASED PROGRAMS	STORY-BASED PROGRAMS
Big Idea	+	+++
Compelling	++	+++
Concise	+	+++
Comprehensive	+++	++
Focused	+	+++
Surprising	+	+++
Visual	+++	+++
Memorable	++	+++

Over-simplify, and you provide too little information; the presentation loses necessary detail, richness and, most importantly, credibility. Over-complicate, and your audience is flooded with too much detail, resulting in confusion, boredom and loss of differentiation. In sum, both overly simplified lectures and overly complicated ones are ineffective.

Having the right *story structure* is essential, but it’s not enough. What really makes a story superior to the dull lecture, and other conventional forms of communication, is *story flow*.

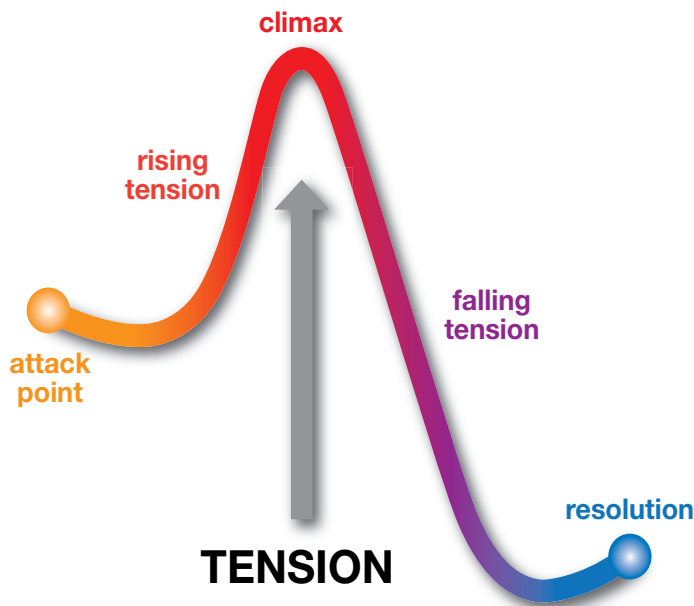
## Scientific Story Flow

Story flow is the “secret sauce” that makes a powerful scientific story work much better than conventional, flat lectures.

The key ingredient in story flow is **DRAMATIC TENSION**.

“Good stories are driven by conflict, tension and high stakes,” said William Landay, an American novelist.

If there’s no tension, there’s no story. This applies to *all* stories, including scientific ones.



What’s the most effective story flow for a scientific presentation? We believe that a compelling scientific story *must* include:

- **The Attack Point** a compelling beginning that *immediately* creates intense curiosity
- **Tension Points** built up then resolved, including the maximal tension point, or climax
- **Flowing Continuity** a smooth, gliding story flow from one tension point to the next
- **Resolution** a satisfying ending that fully supports the Core Story Concept

Presenting a central challenge, or a series of related challenges, creates tension. Presenting the solution to each challenge provides resolution, which audiences often experience as intense satisfaction keeping them engaged throughout the *entire* presentation.

A critical missing piece from many scientific presentations is that they don’t take the time to communicate the “problem” side of the story. They jump immediately—often within the first minute of the presentation—to the solution, i.e., the compound’s benefits. This is a lost opportunity to create dramatic story tension.

Many presenters assume—often incorrectly—that the audience already understands and fully appreciates the problem their product solves. A compelling story arc, however, requires that dramatic tension be developed *first* by vividly portraying the problems/challenges as dramatically as possible.

When the solution is presented as a perfect fit that solves that problem, tension is relieved, resulting in a compelling and memorable story experience.

# MEDSTORY®: Leveraging Story for Scientific & Medical Communication

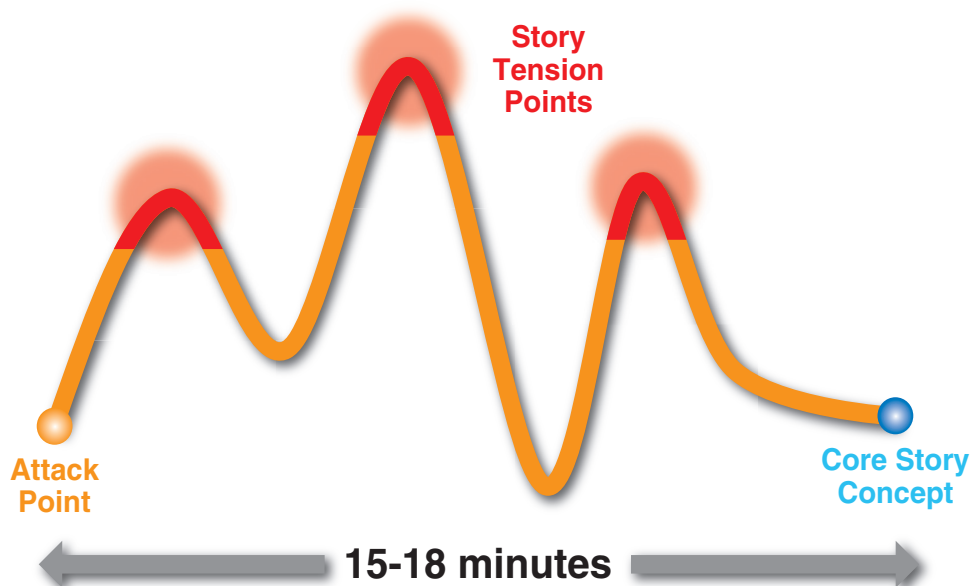
What, then, is the optimal way to communicate a compound's scientific story in a way that has maximum impact? We call it MEDSTORY®.

## A MEDSTORY®:

- Is a well-crafted verbal and visual narrative that communicates the big idea—the Core Story Concept—in a compelling, concise and memorable way
- Identifies the problem that the compound solves, with sufficient scientific detail to educate, but not so much as to overwhelm and cause “cognitive overload”
- Has a meticulously crafted logical and captivating story flow, including a powerful Attack Point, multiple Tension Points that are carefully sequenced, and a satisfying ending that persuades audience that the Core Story Concept is credible
- Integrates the compound's MOA into the story flow in a simple and elegant manner while avoiding having the whole scientific story be only about the MOA
- Contains clear, intuitive and memorable visualizations that help solidify understanding of critical scientific messages and the Core Story Concept

Every MEDSTORY is unique and must be carefully individually crafted, but all MEDSTORYs share the characteristics above.

## Multiple Story Tension Points



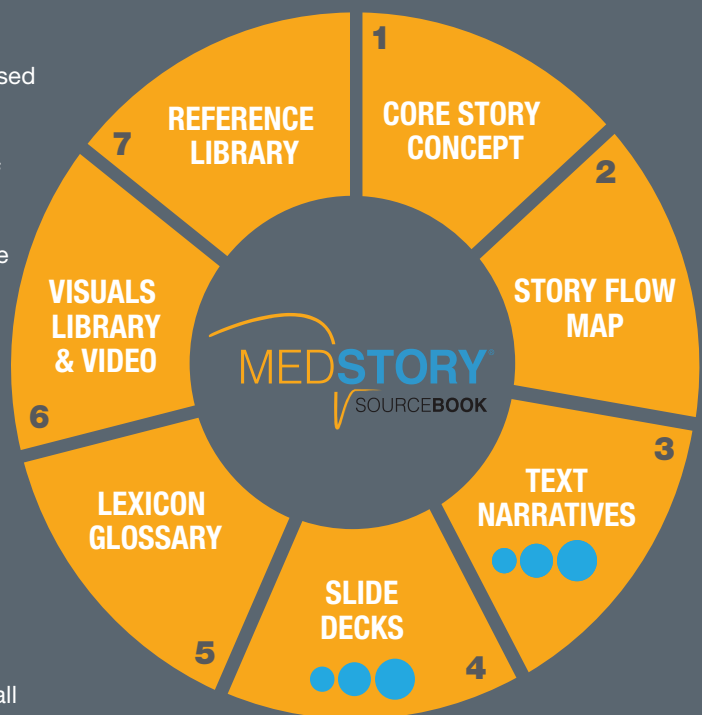


## MEDSTORY SourceBOOK: Rapid, Easy, and Consistent Scientific Story Delivery

Once a great scientific story—including a MEDSTORY—is developed, the next step is communicating that story effectively and consistently to target audiences. You could just send out a single PowerPoint deck of the story to all the people who will be communicating it. But is there a way to distribute *all* the story assets easily and rapidly, including references, visualizations, text narratives, slide decks, and video *bundled into one easily accessible place*? The answer is Yes!

Science Branding Communications has developed the MEDSTORY SourceBOOK®, an *interactive* PDF which contains all the MEDSTORY assets in *one* document that provides multiple benefits:

- Comprehensive – contains all story assets
  - Core Story Concept – the big idea concisely expressed
  - Story Flow Map – a visual outline of the story
  - Text Narratives – short, medium, and full versions of the story in words only
  - Slide Decks – short, medium, and full versions of the story in slides with speaker notes
  - Lexicon Glossary – a comprehensive list of all story-related terms defined concisely
  - Visuals Library – all visual assets in native form for easy access
  - Reference Library – PDFs of all references cited with complete annotations
- Easy-to-distribute – all story assets put into a single digital “bundle”
- Easy-to-use – interactive PDF allows rapid access to all story assets
- Elegant professional graphic design



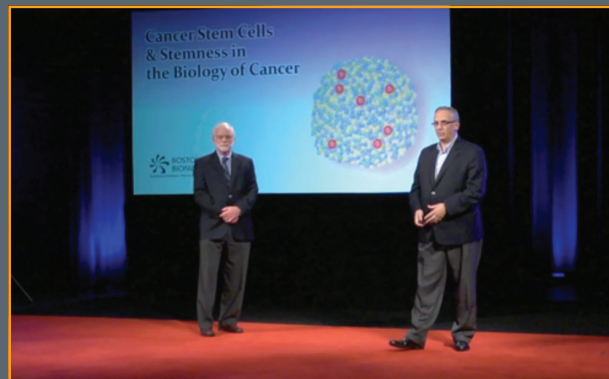
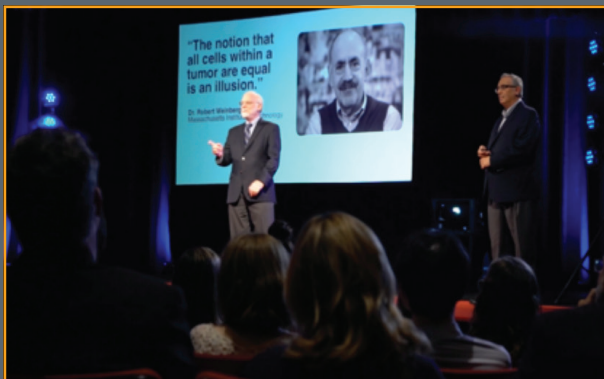
## MEDSTORY LiveTALK®: Delivering the Scientific Story in a TED-Like Experience

The TED talk format has become extremely popular, and some would say, has revolutionized the communication of highly technical subjects, including medical science. Wouldn't it be great to have your MEDSTORY told in a TED-like video by a prominent speaker on a large stage with a high-definition display floating above them in front of a live audience?

Science Branding Communications has developed LiveTALK®, a professional produced video that has the look, feel, and sophistication of a TED talk and delivers your full MEDSTORY in a concise time frame: 15-18 minutes.

LiveTALK® features include:

- Presentation delivered by a renowned Thought Leader
- Option of having Dr. Edward Perper, or a second Thought Leader or company medical director, serve as a co-presenter
- Fully scripted with use of teleprompters
- High production value (3 cameras with use of multiple angles, lighting, sound, post-production editing)
- Can be utilized on your website, in your tradeshow booth, or distributed to media on DVD



## The Neurobiology of Story



Neuroscientists have found that the brains of people being told a story are activated similarly to those of the person telling the story, almost as if they were experiencing the event themselves.

In a study<sup>1</sup> published in the Proceedings of the National Academy of Sciences in 2010, researchers at Princeton University used functional MRI (fMRI) to record the brain activity of a speaker telling an unrehearsed real-life story and the brain activity of a person listening to that story. During successful communications, speakers' and listeners' brains exhibited joint,

temporally coupled response patterns, demonstrating that story communication is a shared activity resulting in a transfer of information across brains and, quite amazingly, that the brain activity patterns of the story listener often almost duplicate that of the story teller!

Other neurobiological research using fMRI has shown that there is greater brain activity associated with reading or hearing stories than with a straight presentation of facts. In a 2014 study<sup>2</sup> using both fMRI and PET scanning, researchers from the National Institutes of Health and the University of Maryland

found that when volunteers underwent brain scanning while telling and listening to stories, specific language-related regions of the brain were activated, demonstrating that storytelling has unique effects on the human brain.

<sup>1</sup> Speaker-listener neural coupling underlies successful communication," by Greg J. Stephens, Lauren J. Silbert and Uri Hasson; PNAS Early Edition, Vol. 107, No. 32

<sup>2</sup> Neural correlates and network connectivity underlying narrative production and comprehension: a combined fMRI and PET study; AbdulSabur NY, Xu Y, Liu S, Chow HM, Baxter M, Carson J, Braun AR; published in Cortex; August 2014.

## Robust Evidence That Scientific Stories are More Powerful

Whether promoting a pharmaceutical or teaching anatomy to medical students, it is imperative that the audience walks away remembering key points from what was presented.

One study observing medical lectures showed that narratives tap into several key learning processes including providing a relevant context for understanding, engaging learners, and promoting memory.<sup>3</sup>

It is the underlying causal structure of a story that explains the consistent finding that stories are read more quickly and understood more accurately when compared with conventional lecture-like text.<sup>4,5,6</sup> The structure of stories provides a natural organizational scaffold that is familiar and aids learners in understanding relationships between ideas and events.<sup>7</sup>

In fact, stories are believed to reflect the natural way people understand and remember information.<sup>8</sup>

Stories improve recall of information through the introduction of thematic organization (mental map).<sup>9</sup> Beyond mental organization, people who read stories are continuously engaged in the cognitive work of making inferences and anticipating possible outcomes to make sense of the events described.<sup>10</sup>

A study examined how efficient story-like narrative texts were compared to lecture-like factual text in communicating science, with a group of university students. In contrast to the lecture-like factual text, when reading a narrative, the information was retained significantly longer. In fact, narrative text was read twice as fast and recalled twice as well.<sup>11</sup>

<sup>3</sup> Easton G. How medical teachers use narratives in lectures: a qualitative study. *BMC Medical Education* 2016;16:3.

<sup>4</sup> Graesser AC, et al. Advanced outlines, familiarity, and text-genre on retention of prose. *The Journal of Experimental Education*. 1980;48:281-290. <http://www.jstor.org/stable/20151355>.

<sup>5</sup> Tun PA. Age difference in processing expository and narrative texts. *J Gerontology: Psychological Sciences*. 1989;44:9-15.

<sup>6</sup> Zabrocky KM, Moore D. Influence of text genre on adults' monitoring of understanding and recall. *Educ Gerontol* 1999;25(8):691-710.

<sup>7</sup> Willingham DT. Why don't students like school? A cognitive scientist answers questions about how the mind works and what it means for the classroom. San Francisco, CA; Jossey-Bass 2009.

<sup>8</sup> Graesser AC, et al. How does the mind construct and represent stories? *Narrative Impact: Social and Cognitive Foundations*, eds Green MC, Strange JJ, Brock TC (Lawrence Erlbaum, Mahwah, NJ) 2002;229-262.

<sup>9</sup> Bower GH, Clark MC. Narrative stories as mediators for serial learning. *Psychonomic Science*. 1969;14:181-182.

<sup>10</sup> Graesser AC, et al. Constructing inferences during narrative text comprehension. *Psychological Review* 1994;101:371-395.

<sup>11</sup> Negrete A, Lartigue C. The science of telling stories: Evaluating science communication via narratives (RIRC method). *Journal Media and Communication Studies* 2010;2:98-110.



# In Summary

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Achieving all this is not easy or straightforward. Synthesizing and simplifying large amounts of complex scientific data and other information—including the views of internal and external experts—to craft a clean, cohesive narrative takes time, effort and a combination of *scientific* expertise and scientific *storytelling* expertise.

This is what we do at Science Branding Communications. In fact, it's our sole mission and passion.

The stakes are high. With the increasing number of drugs targeted to specific diseases, it's more important than ever to scientifically differentiate yours in the most compelling and memorable way possible.

There's no better or more effective way to do this than with story.

Steve Denning, an award-winning author and communications expert, said it best:

“When it comes to inspiring people to embrace some new change in behavior, storytelling isn't just better than the other tools. *It's the only thing that works.*”

# About the Author



**Edward J. Perper, MD, FACC**, is the founder, CEO and Chief Medical Director of Science Branding Communications, Inc. After receiving a B.S. in Biology from Stanford University and an M.D. from Harvard Medical School, he completed a cardiovascular fellowship at Stanford University Medical Center. He was a practicing cardiologist for 15 years and has been in medical communications for the past 12 years, during which time he has developed more than 200 scientific and medical education programs.

# References

1. Schank RC and Abelson RP. "Knowledge and Memory: The Real Story". In: *Advances in Social Cognition*, Vol. 8, edited by Robert S. Wyer, Jr.; first published 1995 by Lawrence Erlbaum Associates, Inc.
2. Stephens GJ, et al. Speaker-listener neural coupling underlies successful communication. *PNAS Early Edition*; Vol. 107, No. 32; [www.pnas.org/cgi/doi/10.1073/pnas.1008662107](http://www.pnas.org/cgi/doi/10.1073/pnas.1008662107).
3. Berns S, et al. Short- and Long-Term Effects of a Novel on Connectivity in the Brain. *Brain Connectivity*. 2013; Vol. 3, No. 6.
4. Barraza, J. A. & Zak, P. J. 2009. Empathy toward strangers triggers oxytocin release and subsequent generosity. *Annals of the New York Academy of Sciences*, 1167: 182-189.
5. D'Arcy J. *Technically Speaking: A Guide for Communicating Complex Information*. Copyright 1998; Battelle Press.
6. Ma KL, et al. Scientific Storytelling Using Visualization. *Computing Now*. January/February 2012, pp. 12-19
7. Mar RA. The neuropsychology of narrative: story comprehension, story production and their interrelation. *Neuropsychologia*. 2004;42:1414-1434.
8. Chow HM, et al. Embodied Comprehension of Stories: Interactions between Language Regions and Modality-specific Neural Systems. *J Cognitive Neuroscience*. 2013;26:279-295.
9. Heath C and Heath D. *Teaching That Sticks*. July 2010.
10. Rossiter M. Narrative and Stories in Adult Teaching and Learning. *ERIC Digest*. 2002; EDC-CE-02-241, No. 241.
11. Denning S. The Science of Storytelling. *Forbes.com*. 2012. Accessed at: <http://www.forbes.com/sites/stevedenning/2012/03/09/the-science-of-storytelling/>
12. "Presenting Effective Presentations with Visual Aids" May 1996 OSHA Occupational Safety & Health Administration U.S. Department of Labor.



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Bernie Coccia, President  
Science Branding Communications  
bcoccia@ScienceBranding.com  
973.796.8257

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