Software for
Business Intelligence

BizInt Smart Charts

Patents & IP Sequences | Clinical Trials | Drug Pipelines

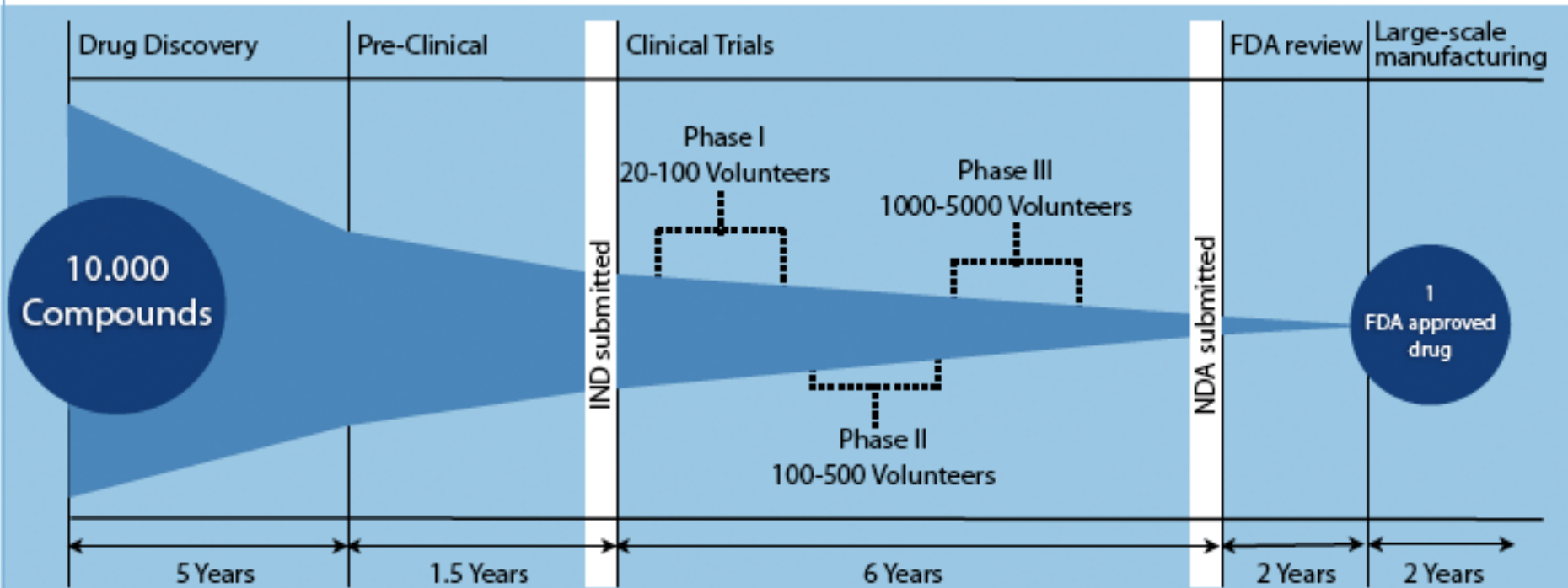# Challenges in Visualizing Pharmaceutical Information – Competitive Launch Landscapes

II-SDV 2016, Nice

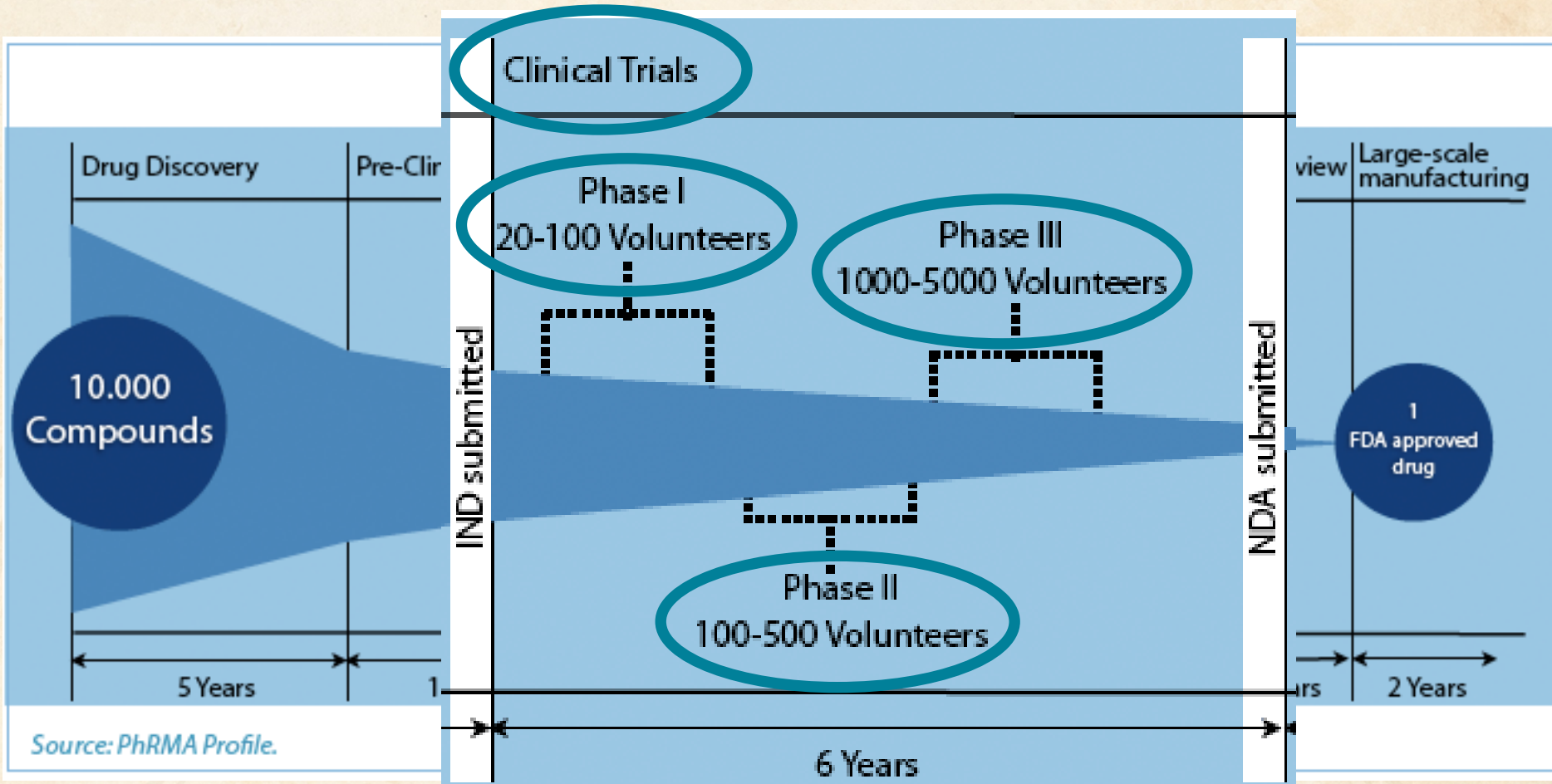*Diane Q. Webb, President*

18 April 2016

www.bizint.com

The Drug Development "Pipeline"

Drug Discovery	Pre-Clinical	Clinical Trials	FDA review	Large-scale manufacturing

10.000 Compounds

IND submitted

Phase I
20-100 Volunteers

Phase III
1000-5000 Volunteers

Phase II
100-500 Volunteers

NDA submitted

1 FDA approved drug

| 5 Years | 1.5 Years | 6 Years | 2 Years | 2 Years |

Source: PhRMA Profile.

At each stage of the pipeline, companies need information on drugs in development to make both business and research decisions.

Clinical Trials Phases in the Drug Pipeline

Drug Discovery | Pre-Clin... | Clinical Trials

10.000 Compounds

Phase I — 20-100 Volunteers

Phase II — 100-500 Volunteers

Phase III — 1000-5000 Volunteers

IND submitted

NDA submitted

...view | Large-scale manufacturing

1 FDA approved drug

5 Years | 1... | 6 Years | ...rs | 2 Years

Source: PhRMA Profile.

2013 II-SDV Paper: *Challenges in Visualizing Pharmaceutical Business Information*

"**The Problem:**

Visualizations developed for scientific and patent data do not do a good job of "telling the story" when applied to drug pipeline data and often need significant changes."

2013 II-SDV Paper – sample "piano" charts

2013 II-SDV Paper – sample "bulls-eye" charts
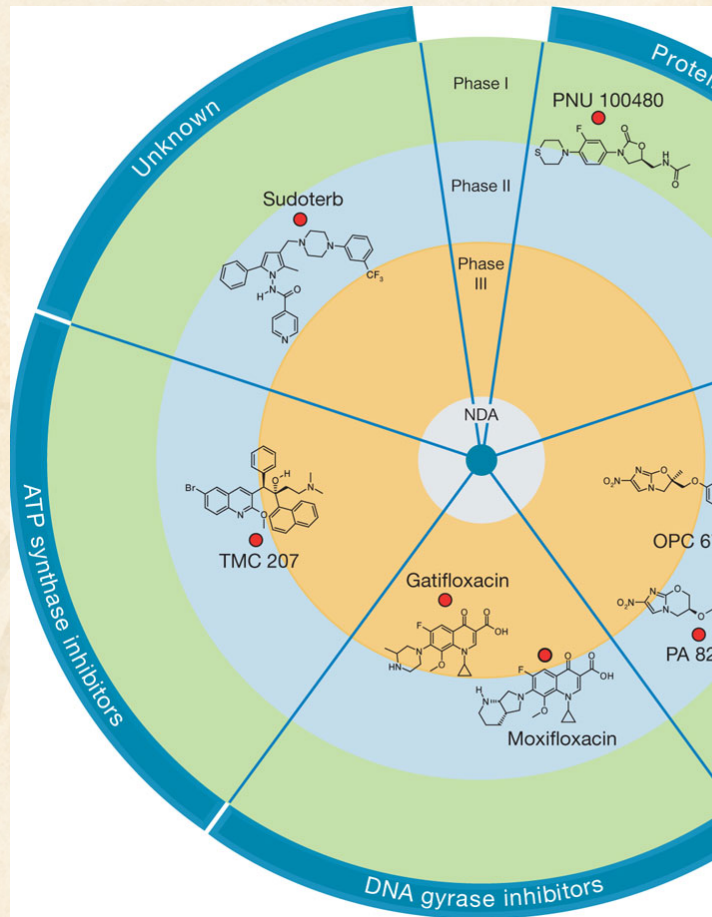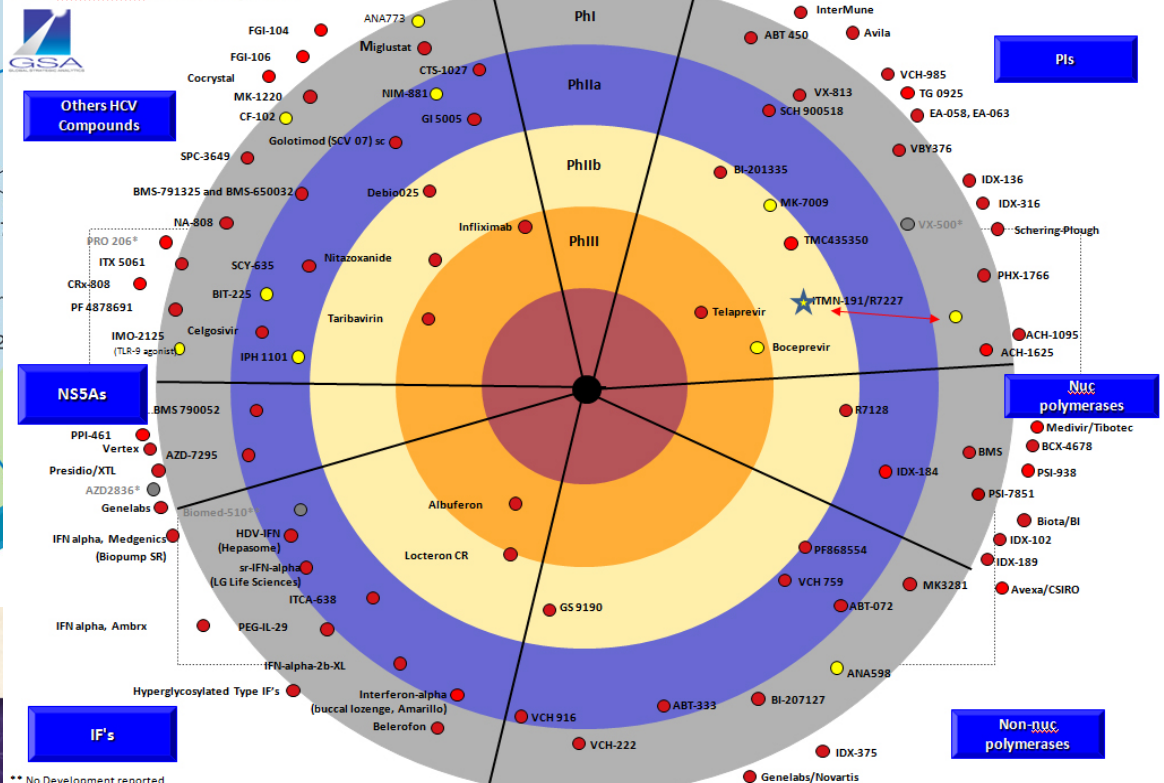
2013 II-SDV Paper – clinical trial timelines

2013 II-SDV Paper – key conclusions for pharmaceutical visualizations:

- Generally cannot be created with standard visualization libraries.
- Operate at both the exploratory and explanatory levels.
- Require multiple sources for completeness and accuracy.
- Rely on data cleanup and de-duplication tools.
- Often use categorical vs numeric coordinates; discrete vs. aggregate values.

2015: "Launch timeline" development

- Grows out of use of Trial Timelines by customers.
- Trial timelines show when a set of *clinical trials* for a drug are projected to end.
- CI analysts need a timeline showing "launch" dates -- when each of a set of *drugs* are expected to be on the market.

Trial Timeline (CT.gov, Adis, TrialTrove)
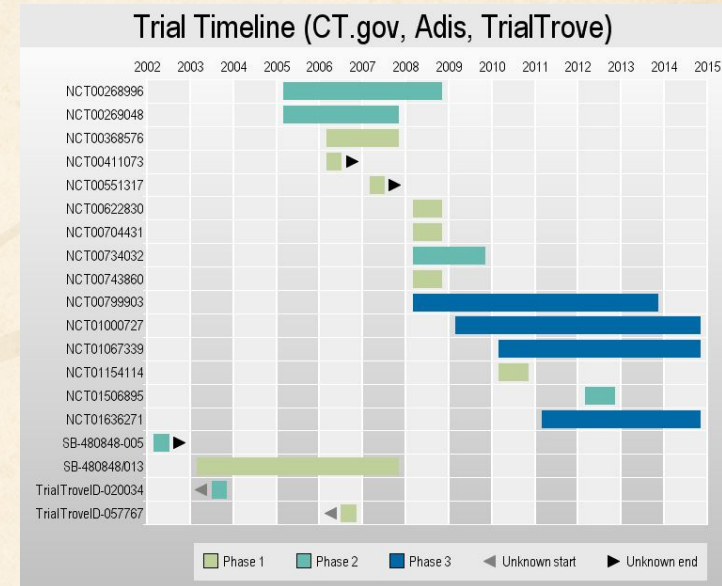
Launch Timelines - samples
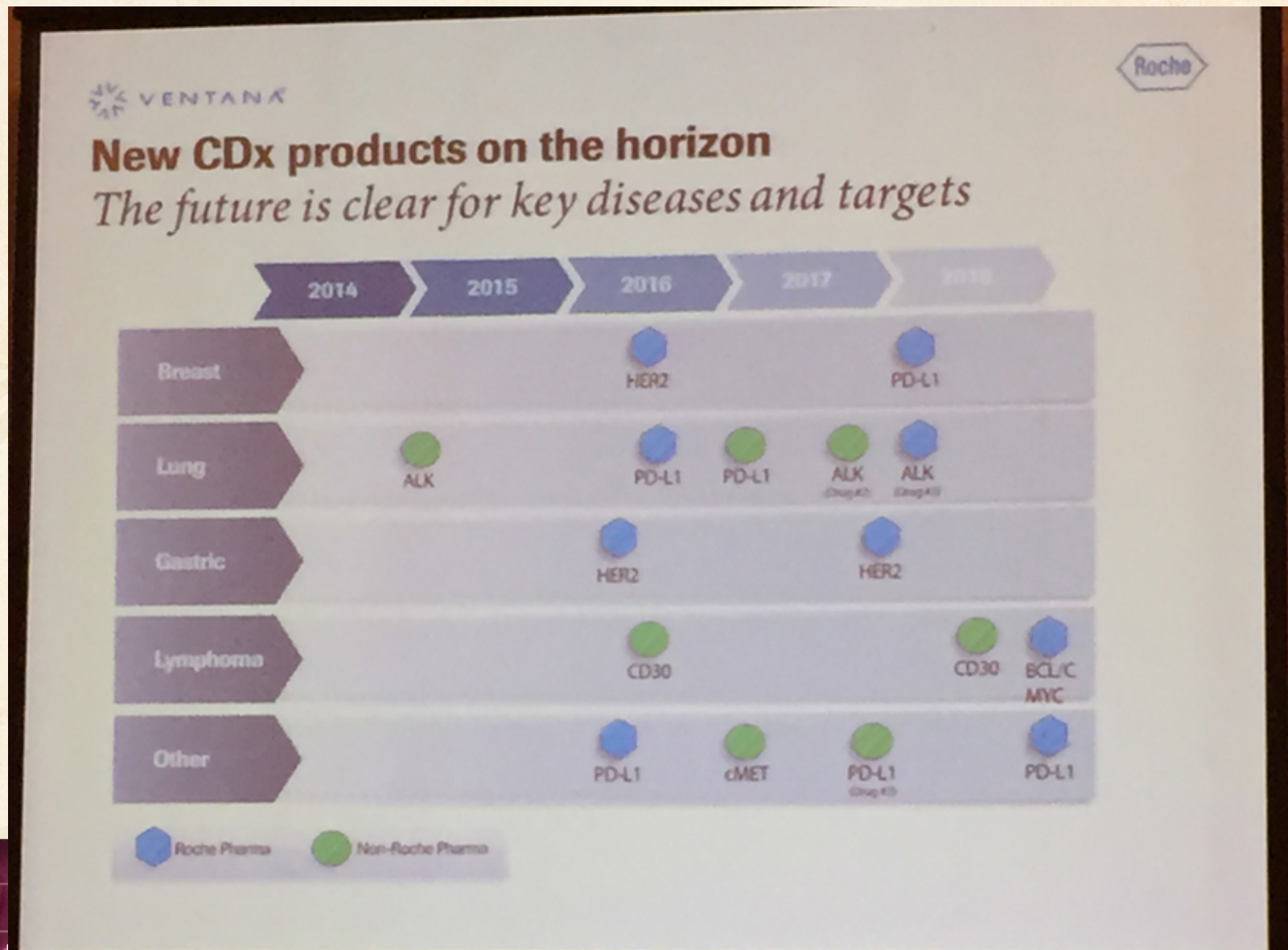
Key features of launch timelines
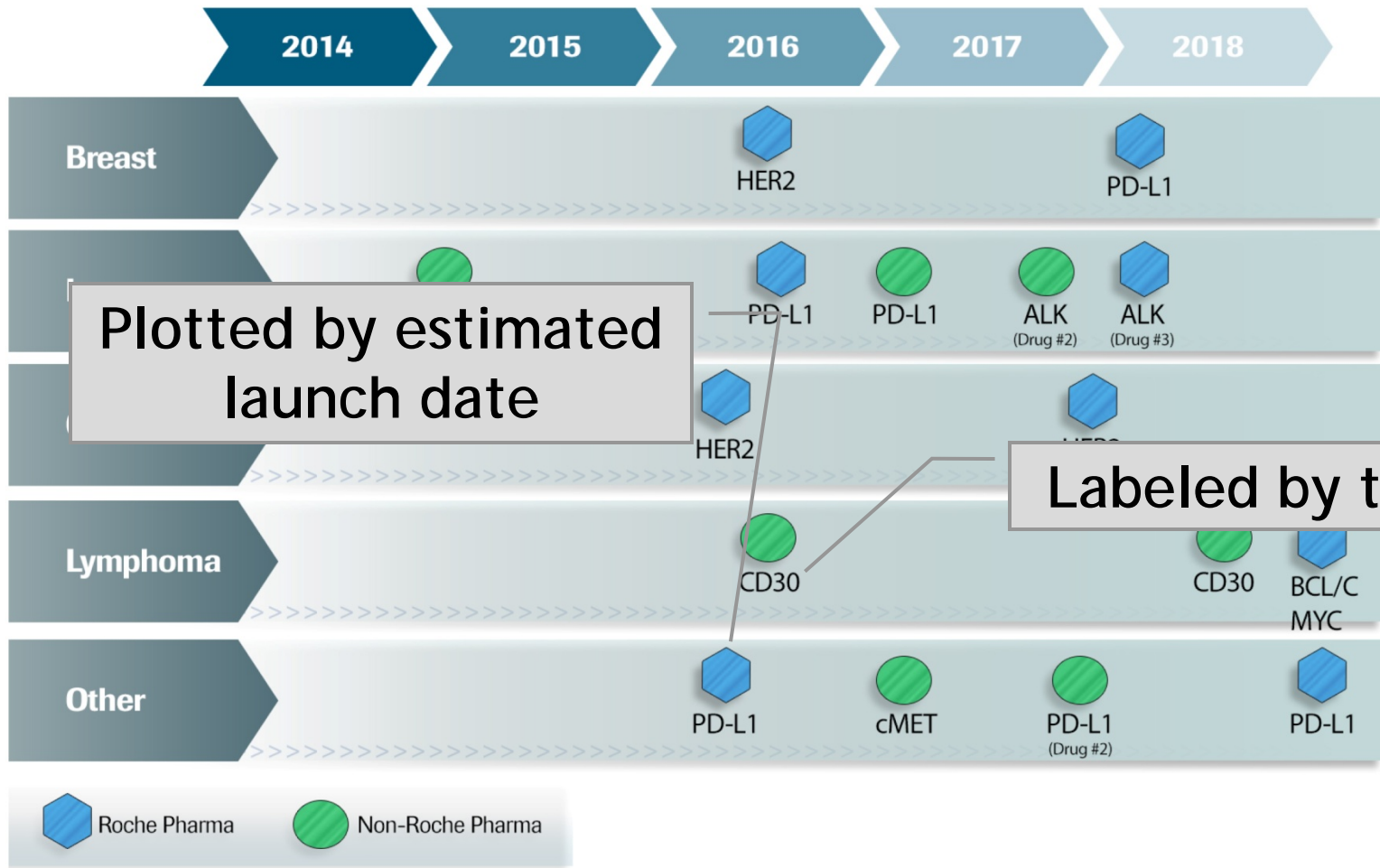
Plotted by estimated launch date

Labeled by target

Key features of launch timelines
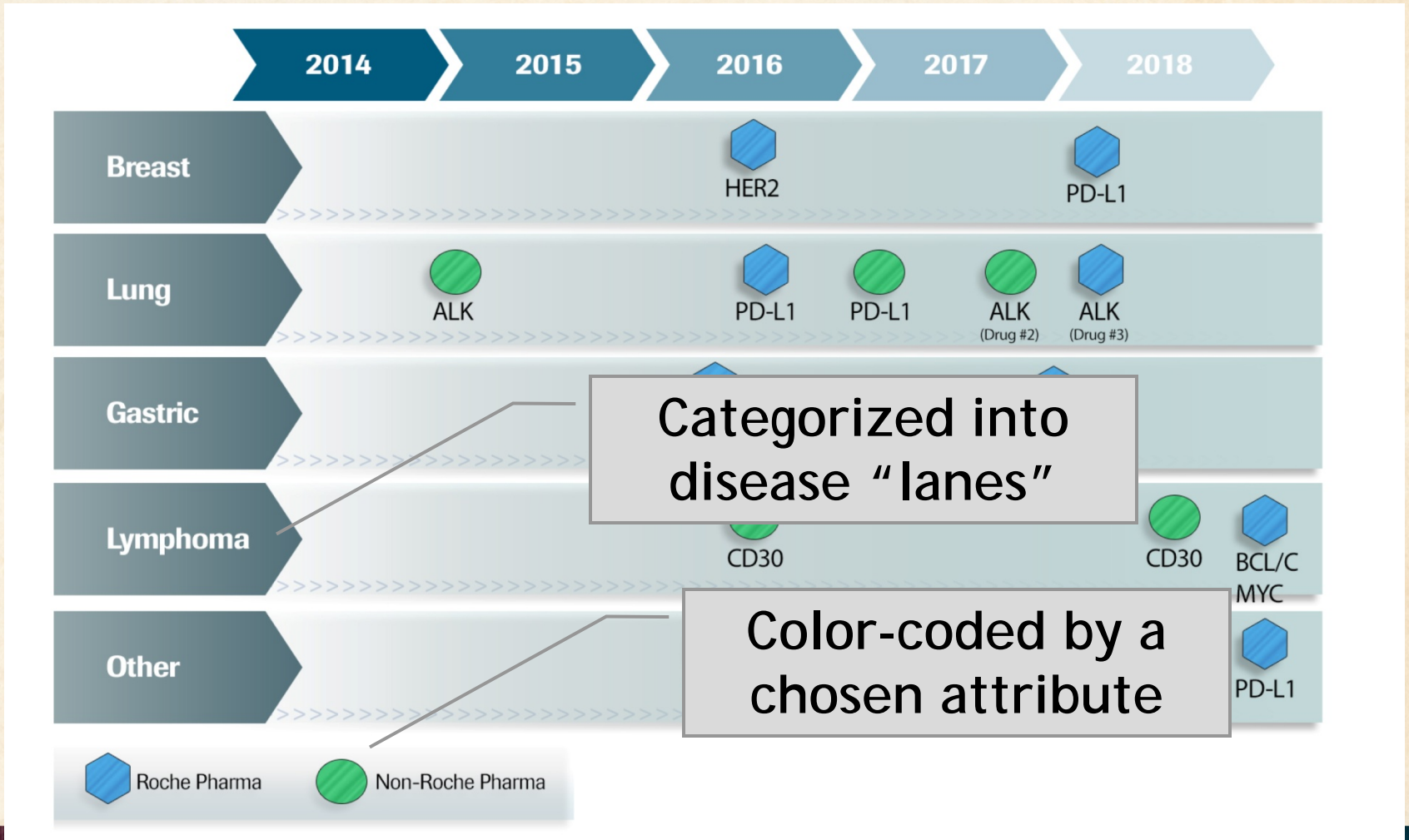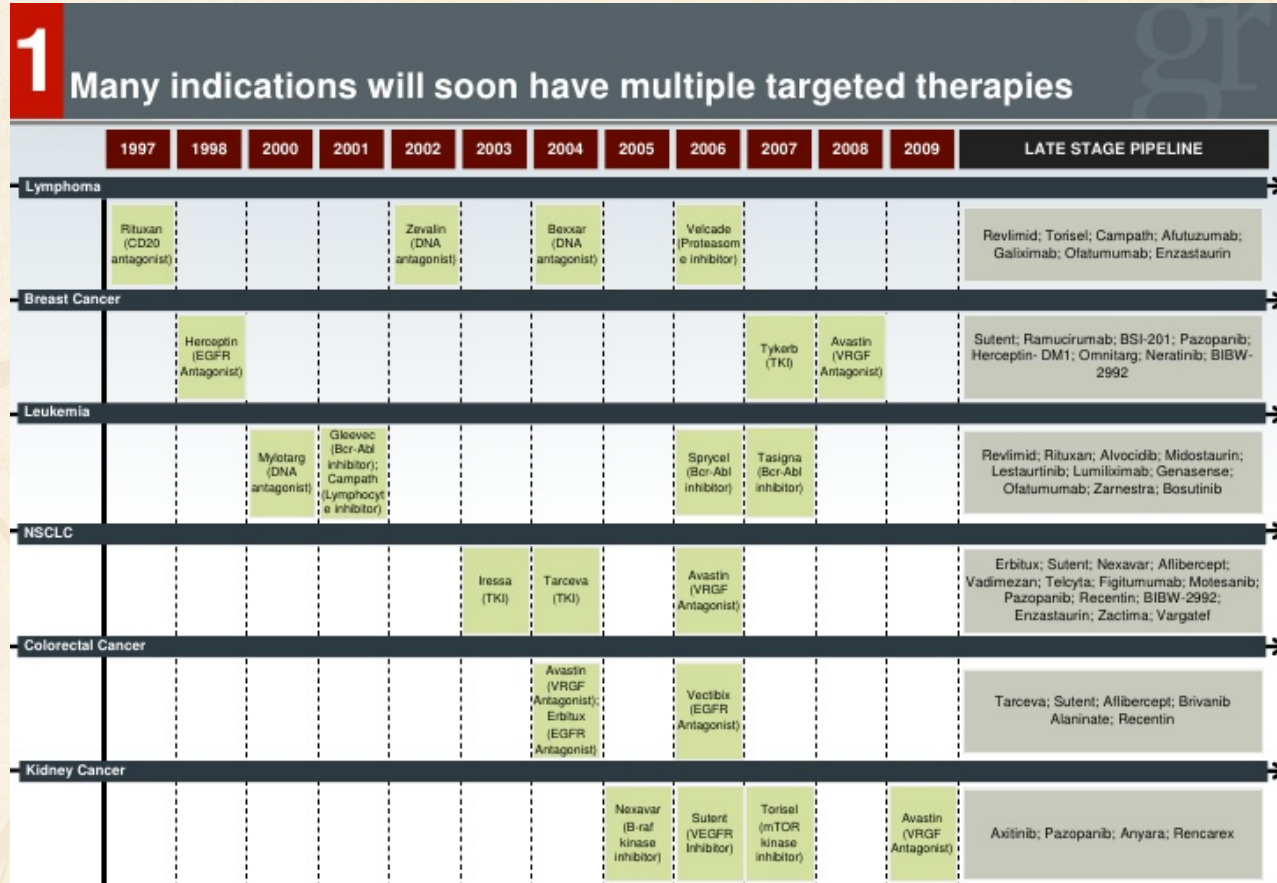
Categorized into disease "lanes"

Color-coded by a chosen attribute
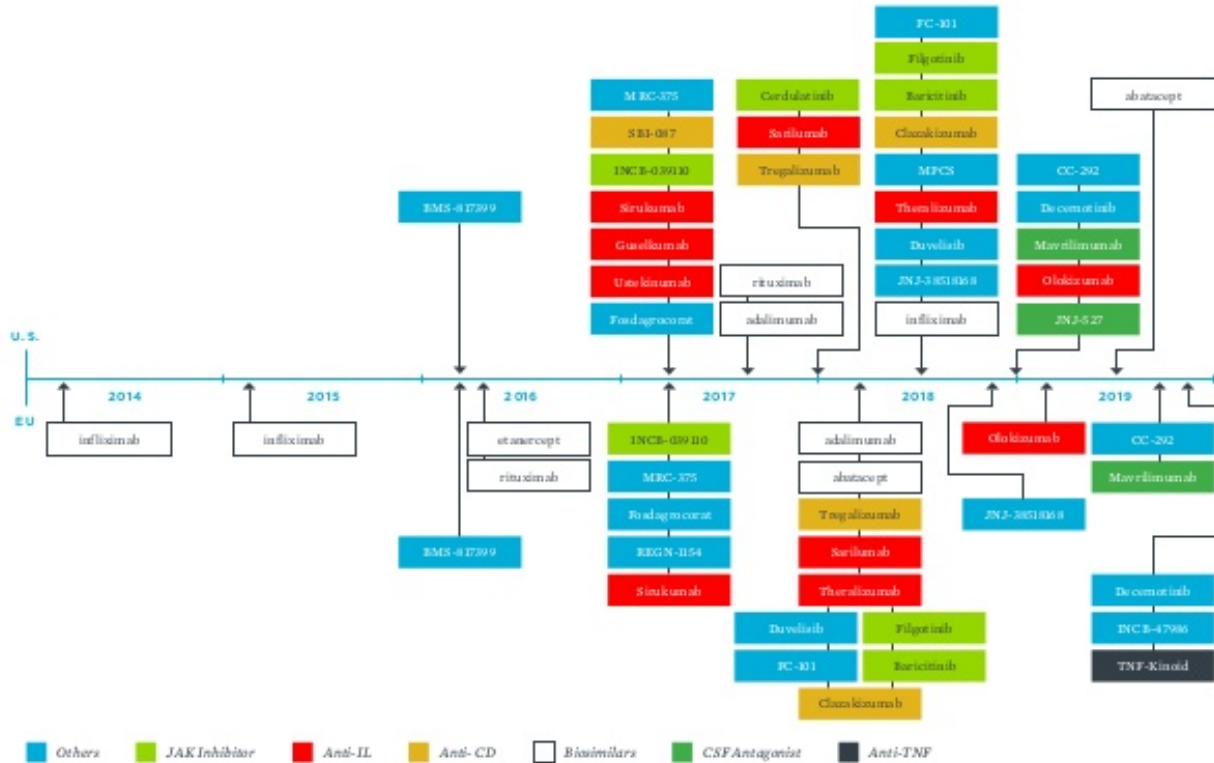
Launch Timelines - samples

Launch Timelines - samples

Launch Timelines - samples

Launching a Global MS Franchise[1]

Launch Timelines - samples
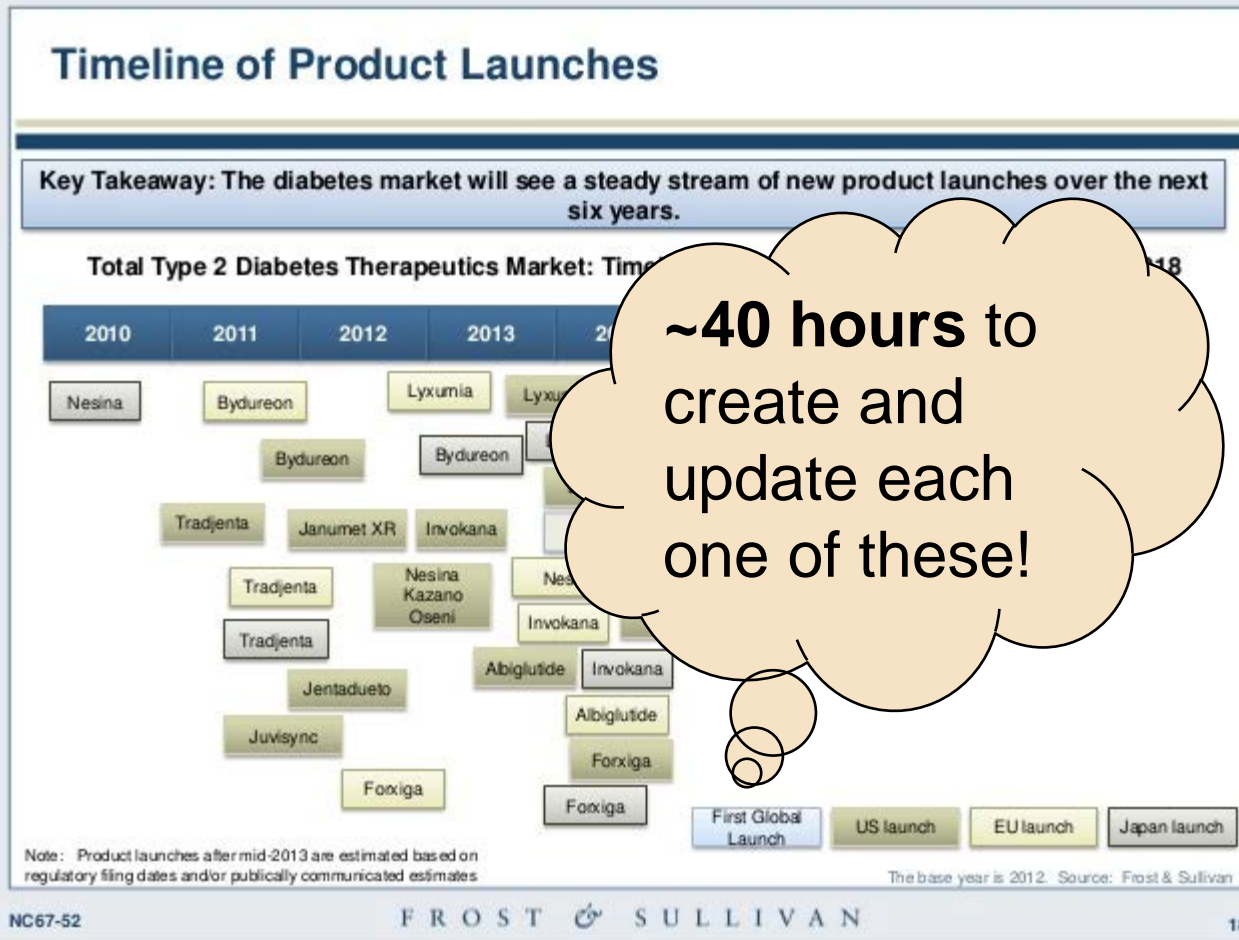
Process to develop the Launch Timeline

- Analyze and discuss requirements with customers – Jan 2015.
- Identified a *vis.js* visualization with some of the key properties to use as a starting point.
- Worked with VantagePoint developers to integrate & customize in VP-SCE.
- Graphics designer adds polish to visualization and scripting user interface.
- Get customer feedback on the beta – Aug 2015.
- Deliver and train the customer – Sept 2015.

Launch Timeline – Final Product

Migraine Launch Timeline
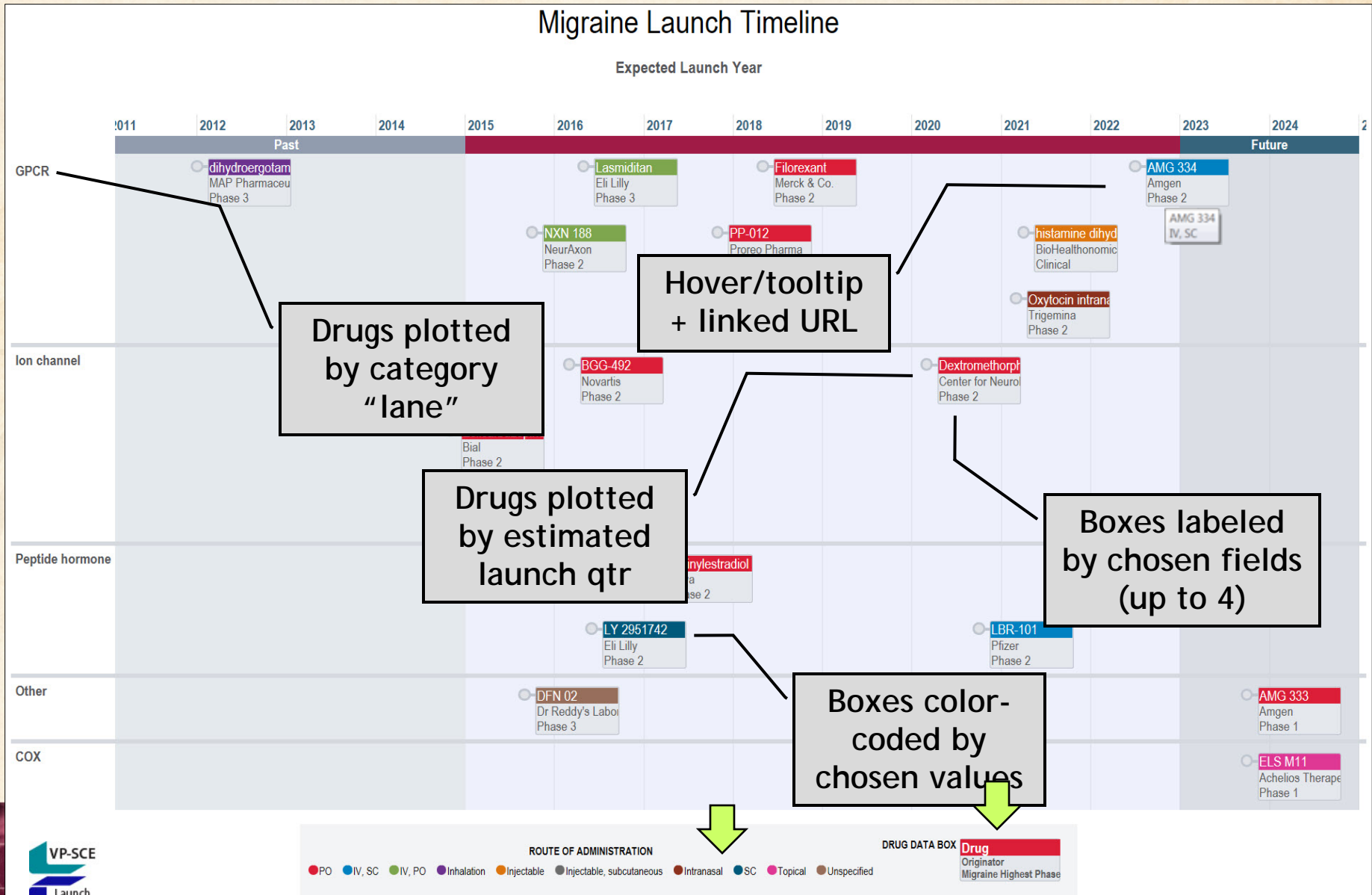
Creating a Launch Timeline

- Fields for each element are selected in the script.
- Most of the data comes from drug pipeline databases.
- Data must be normalized and simplified.
- "Key Drugs" must be chosen from a larger set.
- Estimated launch date is determined by the analyst.

Create Launch Timeline

Create Launch Timeline

Apply a Template (optional)

Saved Templates: No Template

Step 1: Select Required Fields:

Select a Field for the Box Labels:
Drug name

Select a Field for the Lane Labels:
Lane (alternate)

Select a Field for the Launch Date:
Estimated Launch Date

Step 2: Choose Options:

Choose Year: First Year 2015 Last Year 2023
Dates outside this range will appear in Past and Future regions

Choose up to 3 fields to add to the Boxes or to a tooltip: Boxes Tooltip
Company
Phase in Migraine
Route of Administration (Cleaned)

Choose a Field to Color Code the Boxes:
Route of Administration (Cleaned)
  Single group   Each group in field   Each item in field

Step 3: Create Launch Timeline

Template Name:
Save Template

Create Launch Timeline   Cancel

A different view of the same data
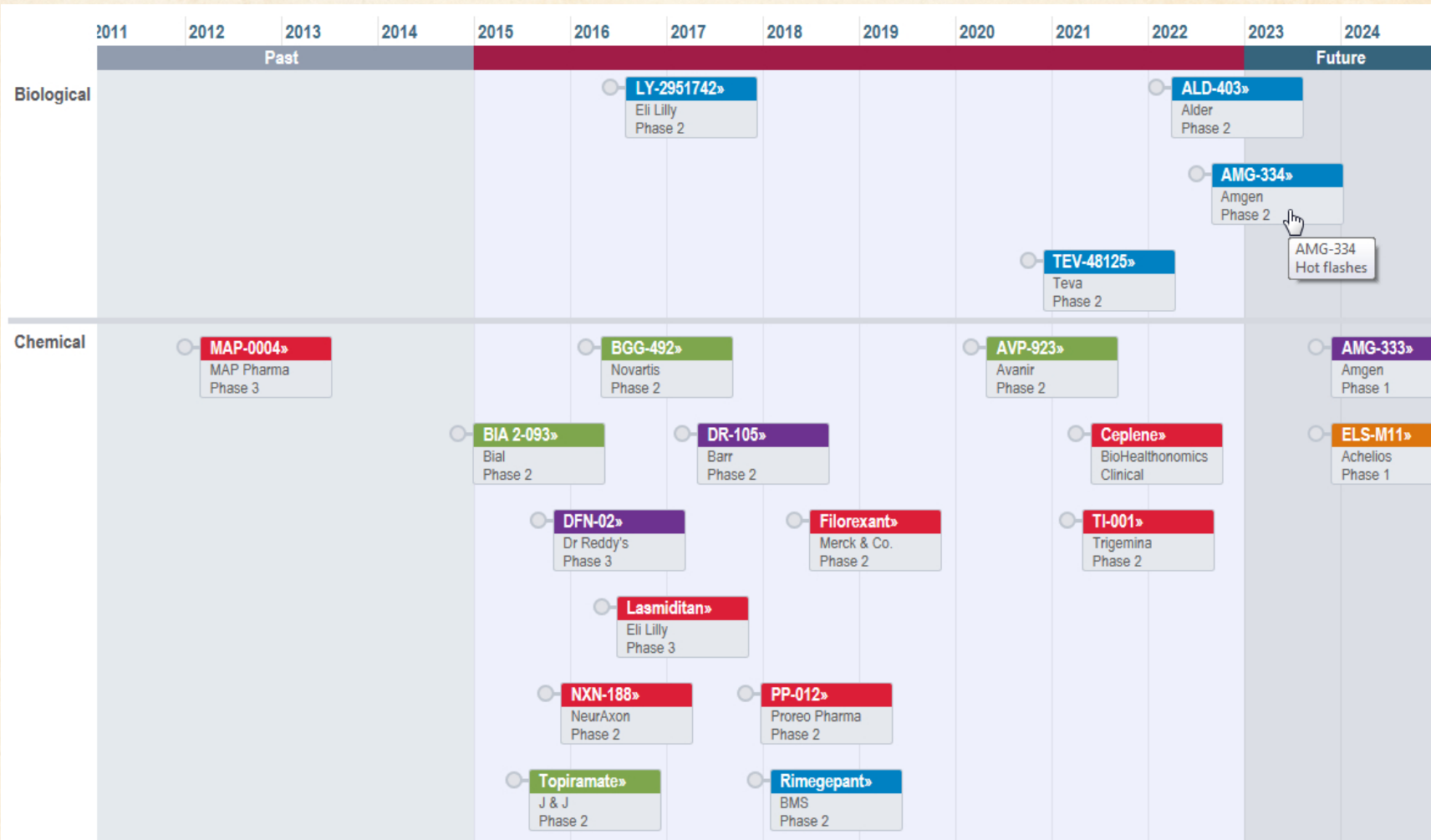
Or, we can create a Patent Expiry timeline

Selected CAS9 Patent Family Expiries
Calculated Expiry Date
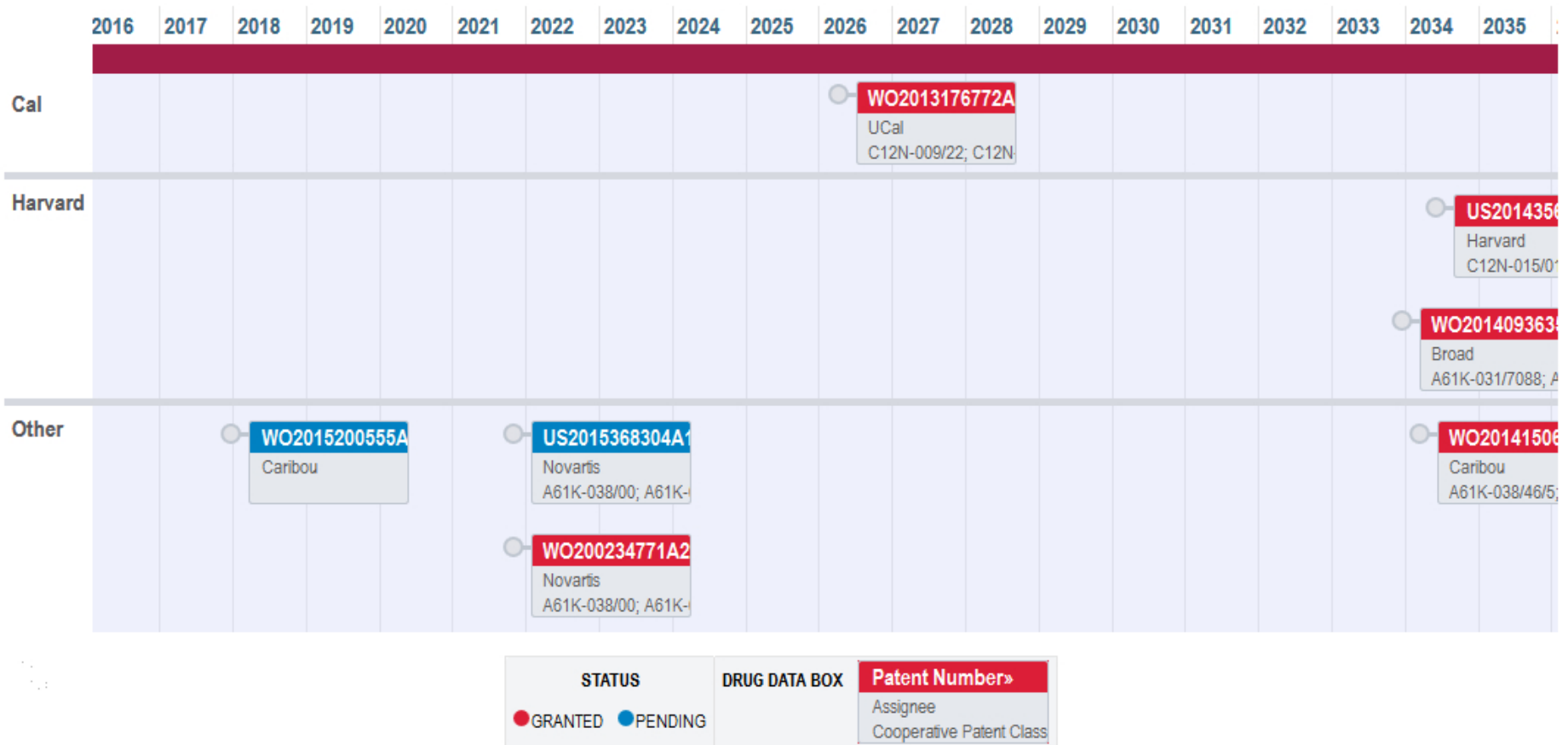
Launch Timeline – delivery issues

- New version of VantagePoint required IE10, which customers could not install.
- HTML delivery of the launch timeline didn't work in Chrome initially.
- Key user retired before delivery.
- Skilled tool users didn't know how to make the analytical decisions.
- And the analysts found the tools intimidating.

But after a difficult start, we now have users creating launch timelines!

Lessons Learned – It's not "Easy"

- Everyone wants an "easy" button!
- The actual drawing of the Launch Timeline is now very easy.
- But as I noted earlier...

  - A lot of data clean-up is needed.
  - The "key drugs" must be selected.
  - Estimated launch date must be determined by the analyst.

Lessons Learned – You need a team

- **Decision maker** who needs the visualization.
- **Competitive intelligence analyst** who knows the disease area and company interests.
- **Search specialist** to collect the correct data.
- **Sophisticated tool user** who can manipulate the data.
- *This will not typically be a single person!*

Lessons Learned – It's all about

- There is some interest in an interactive visualization that people can explore...
- But the primary requirement is for a **PowerPoint slide**.
- An image in a PowerPoint slide is okay...
- But you'd really like to create PowerPoint objects.

"Piano Chart" -- created in Excel with VP-SCE

Clostridium difficile (C-diff) Infection Drugs Under Development - March 2016

Phase I	Phase II	Phase III	Preregistration
BC-7013 Nabriva Therapeutics	AKT-10081 Akthelia Pharmaceuticals	ACAM-CDIFF Sanofi	actoxumab + bezlotoxumab Bristol-Myers Squibb
CRS-3123 Replidyne	CASAD, Salient Pharmaceuticals Salient Pharmaceuticals	actoxumab MassBiologics	bezlotoxumab Medarex
DAV-132 Da Volterra	GBV-006 Globavir	cadazolid Actelion	
DS-2969 Daiichi Sankyo	P1A Prevab R Llc	CB 01-11	
GSK 3894545A	PF 6425090 Pfizer		
	ramoplanin Pfizer		
MGB Biopharma	RBX-2660 Rebiotix		
NVB-302 Novacta Biosystems	ridinilazole Summit		
	SER-109 Seres Health		
	SYN 004 Ipsat Therap		
	VLA-84 Intercell		
	VP-20621 ViroPharma		

Each column contains the drugs in that phase

Option for hyperlink to pipeline record

Drugs color-coded by a chosen field

Labeled by drug name and a chosen field

Key (Delivery Route)

Injected	
Oral	
Rectal	
Topical	
Unspecified	

"Piano Chart" -- prototype in PowerPoint

Phase I	Phase II	Phase III	Preregistration
BC-7013 Nabriva Therapeutics	AKT-10081 Akthelia Pharmaceuticals	ACAM-CDIFF Sanofi	actoxumab + bezlotoxumab Bristol-Myers Squibb
CRS-3123 Replidyne	CASAD, Salient Pharmaceuticals Salient Pharmaceuticals	actoxumab MassBiologics	bezlotoxumab Medarex
DAV-132 Da Volterra	GBV-006 Globavir	Cadazolid Actelion	
DS-2969 Daiichi Sankyo	P1A Prevab R Llc	CB 01-11 Cosmo Pharmaceuticals	
GSK-2904545A GlaxoSmithKline	PF 6425090 Pfizer	Surotomycin Cubist	
MCB 3681 Morphochem AG	ramoplanin Pfizer		
MGB BP 3 MGB Biopharma	RBX 2660 Rebiotix		
NVB 302 Novacta Biosystems	Ridinilazole Summit		
	SER-109 Seres Health		
	SYN 004 Ipsat Therapies		
	VLA 84 Intercell		
	VP-20621 ViroPharma		

Key

Injected
Oral
Rectal
Topical
Unspecified

vantagepoint
Smart Charts Edition

Create Piano Chart

Apply a Template (optional)

Saved Templates: | No Template ▾ |

Step 1: Select Required Fields:

Select a Field for the Box Labels:
| Common Drug Name ▾ |

Select a Field for the Phase:
| Highest Phase (1) ▾ |

Step 2: Choose Options:

Select a Field to add to the Boxes (optional):
| Originator (Cleaned) ▾ |

Choose a Field to Color Code the Boxes:
| Delivery Route (Cleaned) ▾ |

Step 3: Set Chart Title:

Chart Title: | Piano Chart Demo |

Step 4: Create Piano Chart

Template Name: | | Save Template

Thank you to
my "chef" colleagues
at BizInt and
VantagePoint!

Matt Eberle, John Willmore,
Joe Johnson, Bertha Adamson
and Jon Garner, Paul Frey,
Nils Newman

What's Next?

- Enhancements to BizInt Smart Charts to make it easier to prepare the backing data.
- Keep enhancing delivery formats to meet users' needs.
- Implement the "Bulls-Eye" visualization?
- Try some animation for change tracking?

See you again in 2019 ?

Software for
Business Intelligence

BizInt Smart Charts

Questions?

support@bizint.com
bizint.com/slides