Competitive Intelligence: How to Optimize Pipeline and Clinical Trials Data Analysis?

The International Conference on Search, Data and Text Mining and Visualization

Anne Trincot, April 2019

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Objectives

Two methods to optimize Data Visualization for Competitive Intelligence:

① Pipeline and Clinical Trials Data Analysis with BizInt and VantagePoint Solutions

② Global Data Visualizations for a particular Disease: VALEM360 In-house development

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Drug development journey and data sources

R&D → Preclinical → Phase I → Phase II → Phase III Registration → Go to market → Lifecycle Management

PubMed National Library of Medicine NLM

Trialtrove Pharma intelligence | informa

Adis Insight

Evaluate® Intelligent Life Science

OncologyPipeline
Every trial, result and timeline that matters

Clarivate Analytics

Pharma intelligence informa

BIOWORLD™ TODAY
THE DAILY BIOPHARMACEUTICAL NEWS SOURCE

NIH U.S. National Library of Medicine
ClinicalTrials.gov

DRG DECISION RESOURCES GROUP

Pharmaprojects

GlobalData.
Decode the Future

Scrip Pharma intelligence

FDA U.S Food and Drug Administration

IMS Health & Quintiles are now IQVIA™

Integrity
A Cortellis solution
Empowering knowledge-based drug discovery and development

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Pipeline Databases

	Integrity A Cortellis solution	Clarivate Analytics	Pharmaprojects	Adis Insight
Coverage	Since 1988	NA	Since 1980	Since 1995
Users	Researchers, Translational researcher	R&D, BD&L	R&D, marketing, strategy	R&D, regulatory, marketing, strategy
Advantages	Patent information	Deals Patents	Link with TrialTrove	Regulatory Information
Disadvantage	Warning – active status	Updates	No information from public research	Updates
Dataviz	basic	yes	yes	yes

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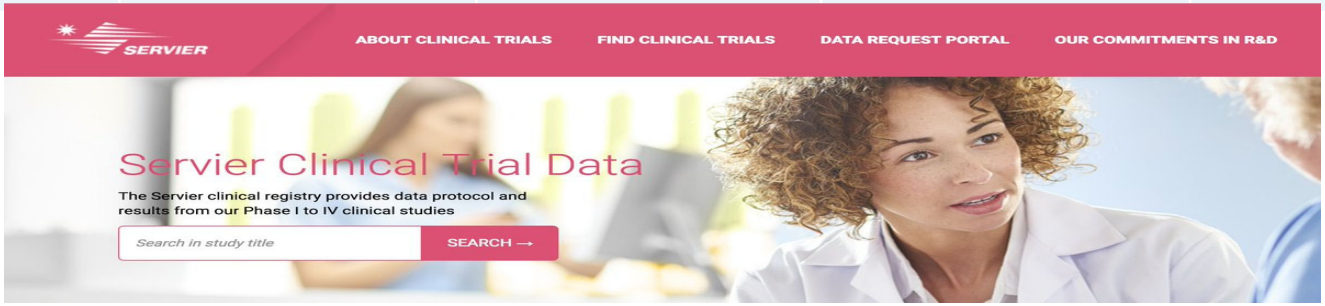
Clinical Trial Databases or Registries

	NIH U.S. National Library of Medicine ClinicalTrials.gov	European Clinical Trials Database EudraCT	International Clinical Trials Registry Platform Search Portal	Trialtrove Pharma intelligence | informa
Coverage	US, World	Europe	World	World
Advantages	The Oldest and Most Well-known	Well-known in Europe	Data from Emergent countries	More exhaustive Link with Pharmaprojects Tagged data
Disadvantage	Not exhaustive	Not exhaustive	Old Website Not exhaustive	**Not free of charge**
Dataviz	no	no	no	yes



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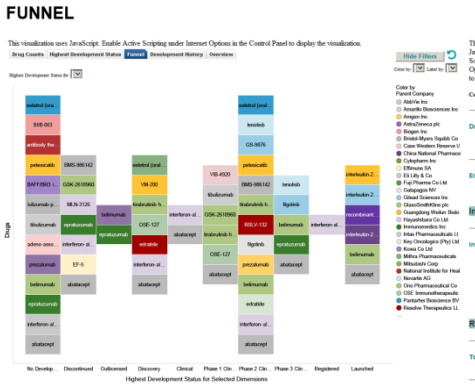
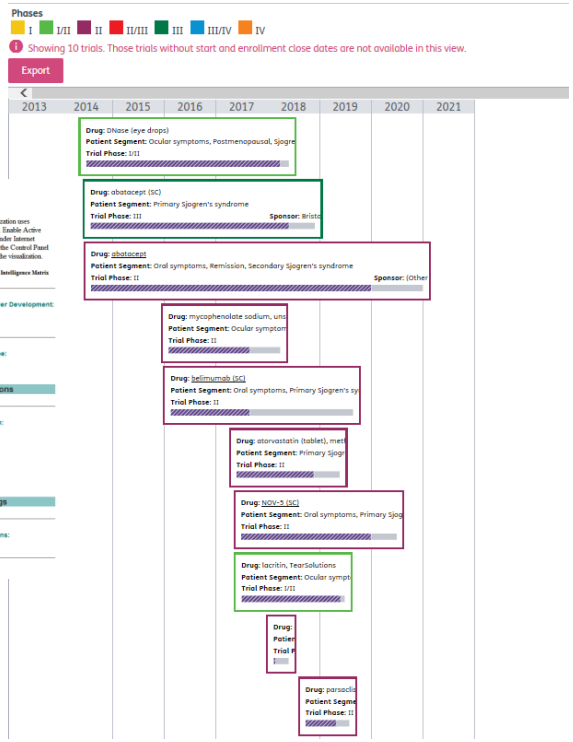
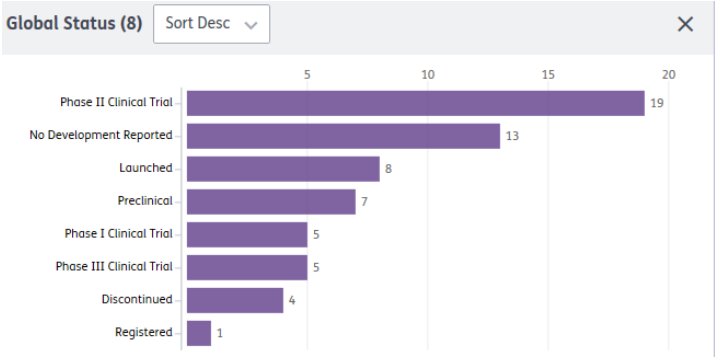
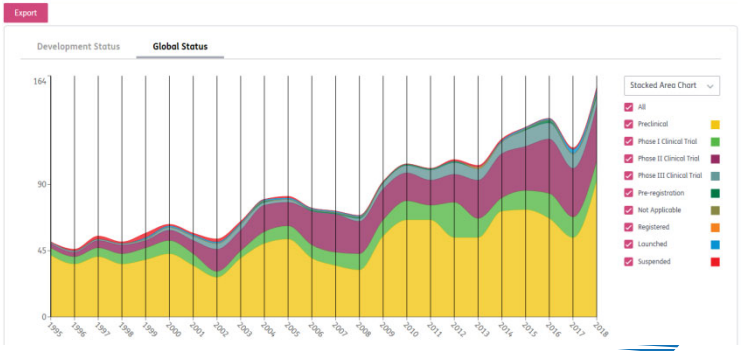
Data Visualizations offered by our suppliers



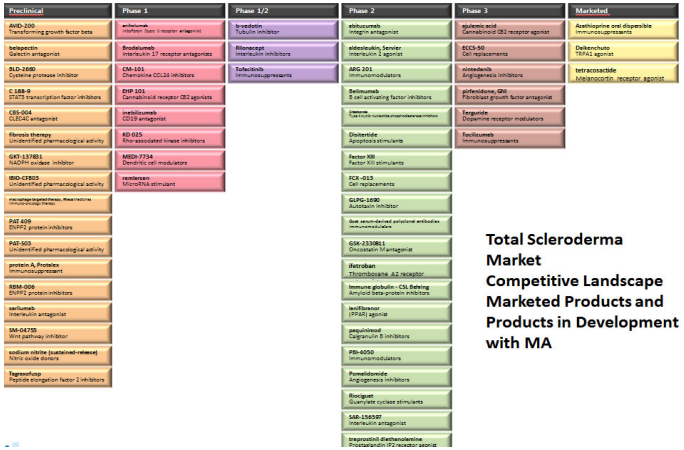




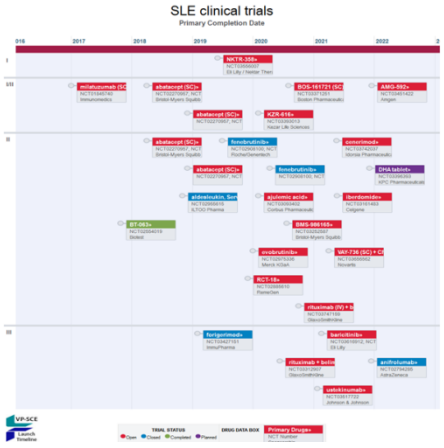


Data Visualization with BizInt and Vantage Point

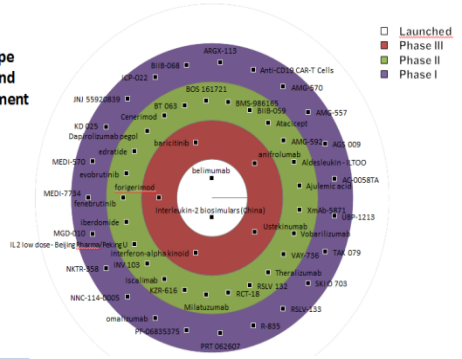
Tools to improve and hone Data Visualization



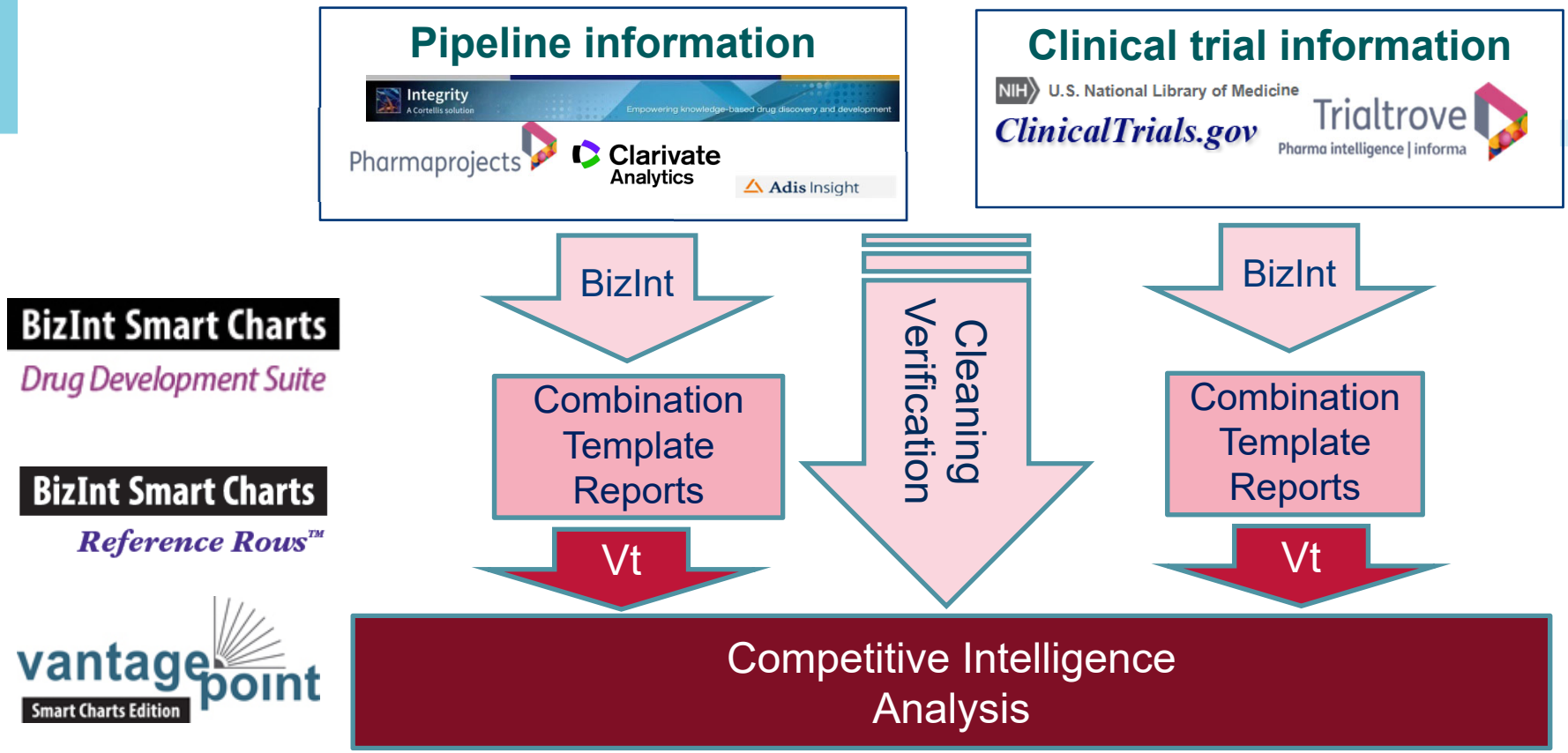
Total Scleroderma Market Competitive Landscape Marketed Products and Products in Development with MA



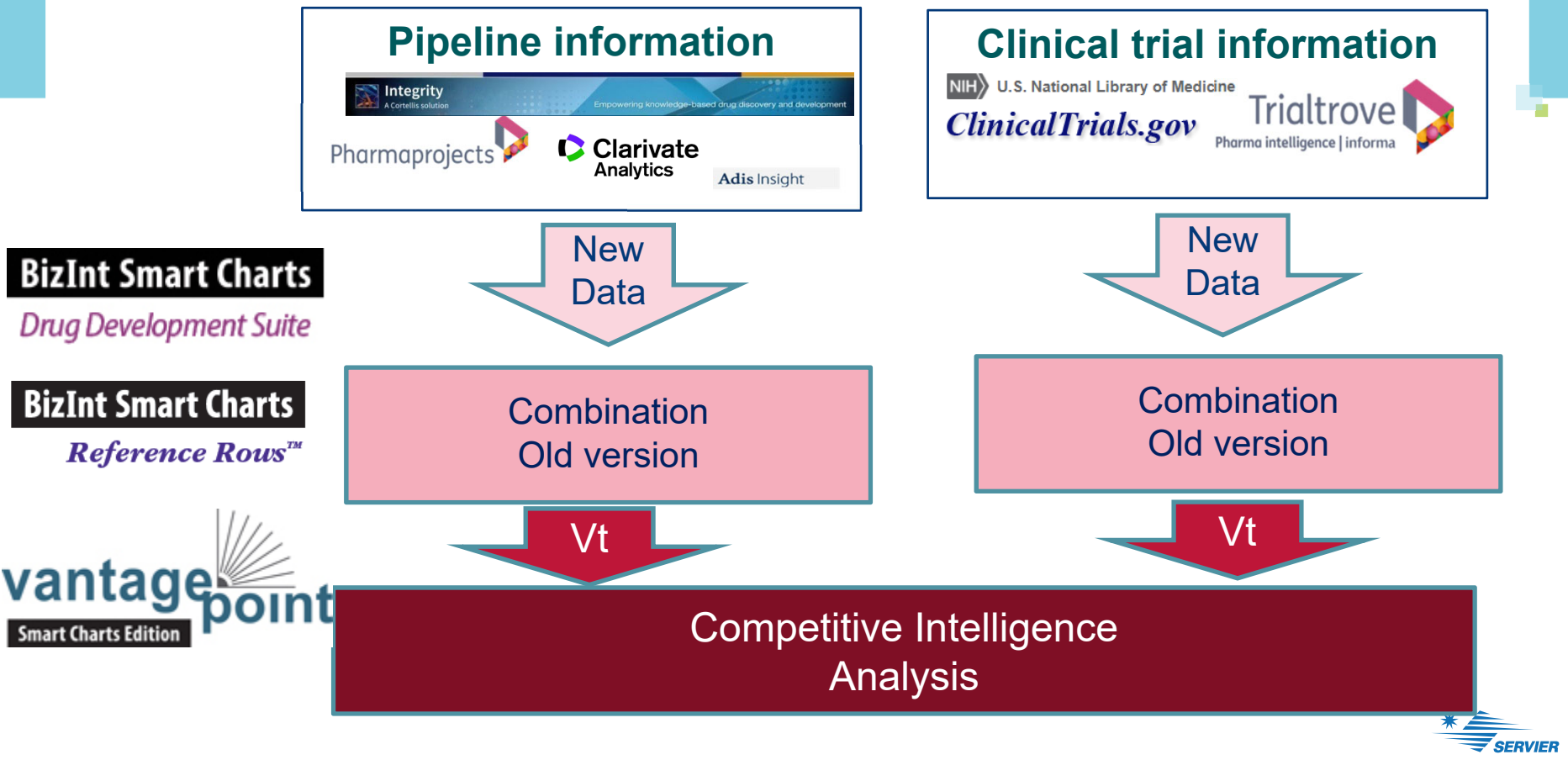
Total SLE Market Competitive Landscape Marketed Products and Products in Development



Predicted Approval dates (US)	
Stelara (Ustekinumab)	2020
Olumiant (Baricitinib)	2022
Lupuzor (forigerimod)	2024
AMG-592	2026
NKTR-358	2026


Pipeline information
Integrity
A Cortellis solution
Empowering knowledge-based drug discovery and development
Pharmaprojects
Clarivate Analytics
Adis Insight
Clinical trial information
NIH U.S. National Library of Medicine
ClinicalTrials.gov
Trialtrove
Pharma intelligence | informa
BizInt Smart Charts
Drug Development Suite
BizInt Smart Charts
Reference Rows™
vantage point
Smart Charts Edition
BizInt
Combination Template Reports
Vt
Cleaning Verification
BizInt
Combination Template Reports
Vt
Competitive Intelligence Analysis

Update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Trialtrove
Pharma intelligence | informa
New Data
New Data
BizInt Smart Charts
Drug Development Suite
BizInt Smart Charts
Reference Rows™
vantage point
Smart Charts Edition
Combination
Old version
Combination
Old version
Vt
Vt
Competitive Intelligence
Analysis
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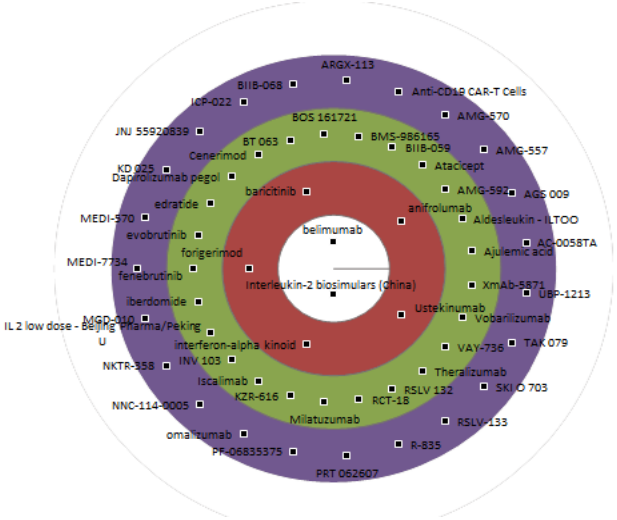
Summarizing pipeline data

Chart visualization

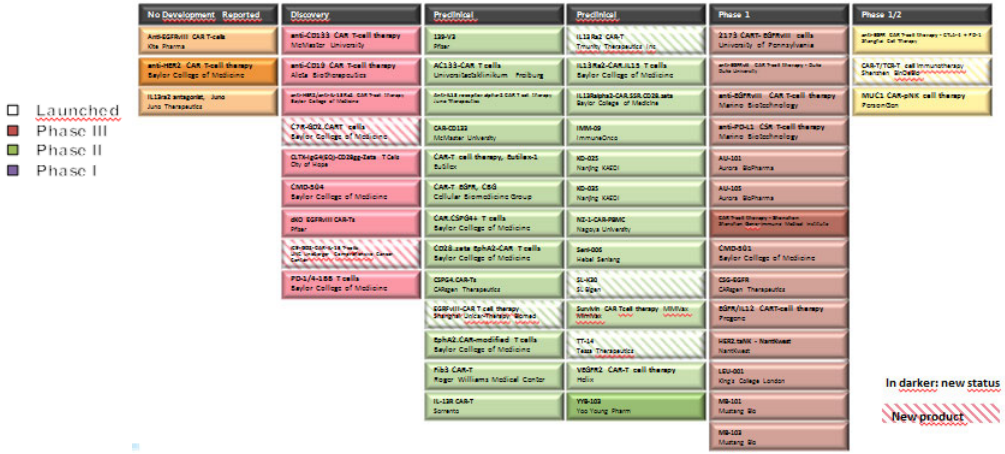
	Primary Drug Name	Common Drug Name	Database	Synonyms	Mechanism of Action	Global Status	Disease Status		Latest Change	Delivery Route	Origin of Material
							Disease	Status			
1.	A-00X	A-00X	1.1 Pipeln | link	A 00X A00X A-00X AAV AQP1 AAV2hAQP1, Kadmon Pharmaceuticals AAVAQP1 AAV-AQP1	Aquaporin stimulant	Phase II Clinical Trial	Xerostomia	Phase II Clinical Trial	Expected timing of Phase I/II trial for xerostomia reported per MeiraGTx presentation	Injectable	Biological, nucleic acid, viral vector
							Radio/chemotherapy-induced injury, unspecified	Phase II Clinical Trial			
							Sjogren's syndrome	Preclinical			
	1.1 Pipeln			1.1 Pipeln	1.1 Pipeln	1.1 Pipeln		1.1 Pipeln	1.1 Pipeln	1.1 Pipeln	1.1 Pipe
2.	abatacept	abatacept	2.1 Pipeln | link 2.2 Adis | link 2.3 CORTL | link	abatacept abatacept (IV) abatacept (SC) BMS-188667 BMS-188667 (IV) BMS-188667 (SC) CTLA4Ig, BMS CTLA4-Ig, BMS (IV) ONO4164 ONO-4164 ONO4164 (IV) ONO-4164 (IV) ONO4164 (SC) ONO-4164 (SC) Orencia Orencia (IV) Orencia (SC)	CD80 antagonist CD86 antagonist T cell inhibitor Immune checkpoint inhibitor	Launched	Arthritis, rheumatoid	Launched	Results for Phase III trial (IM101-291) for lupus nephritis and Phase III study (IM101-550) for RA reported	Injectable Injectable, intravenous Injectable, subcutaneous	Biological, protein, recombinant
							Arthritis, juvenile	Launched			
							Arthritis, psoriatic	Launched			
							Nephritis, lupus	Phase III Clinical Trial			
							Lupus erythematosus, systemic	Phase III Clinical Trial			
							Sjogren's syndrome	Phase III Clinical Trial			
							Dermatomyositis	Phase III Clinical Trial			
							Polymyositis	Phase III Clinical Trial			
							Idiopathic inflammatory myopathy, unspecified	Phase III Clinical Trial			
							Nephrotic syndrome	Phase II Clinical Trial			
							Graft-versus-host disease	Phase I Clinical Trial			
							Ankylosing spondylitis	No Development Reported			

Summarizing pipeline data

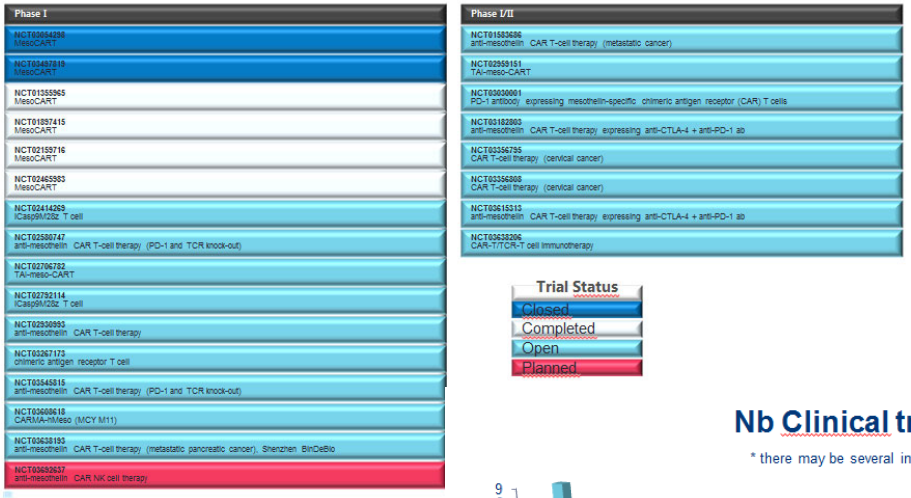
Bullseye Chart

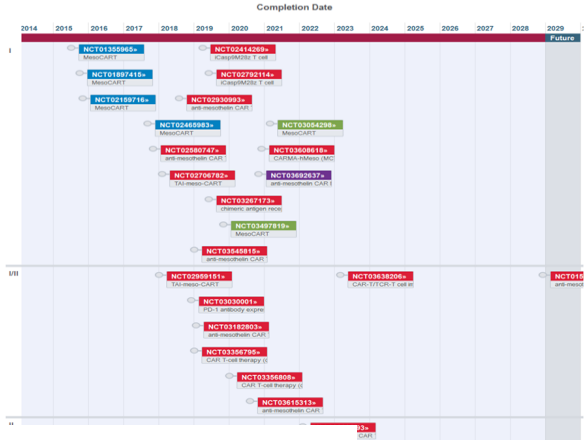


Piano Chart



Clinical trial visualizations

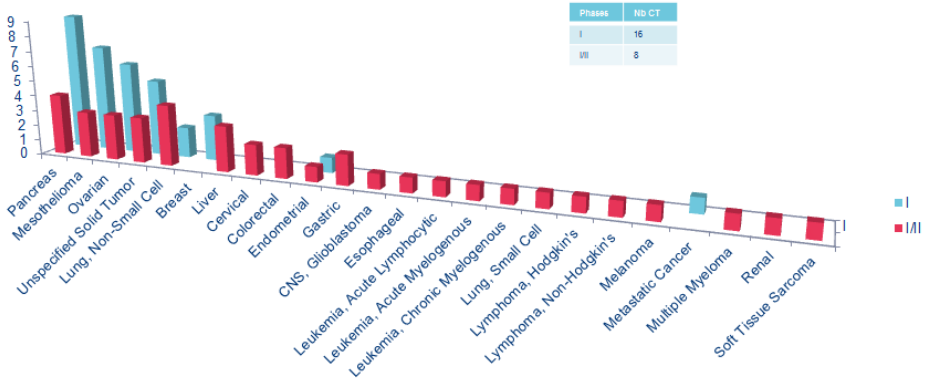




Nb Clinical trials by indication and phase *

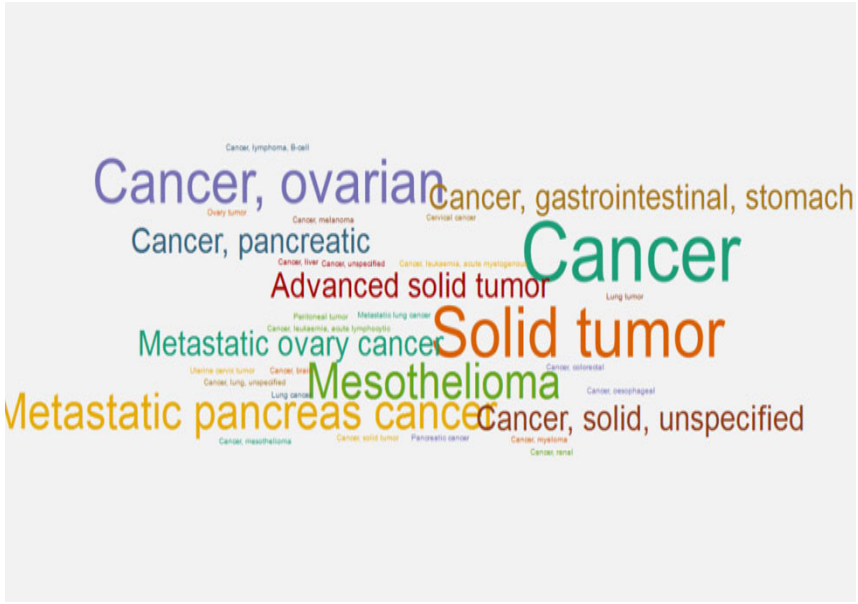
* there may be several indications per study

Phases	Nb CT
I	16
I/II	8

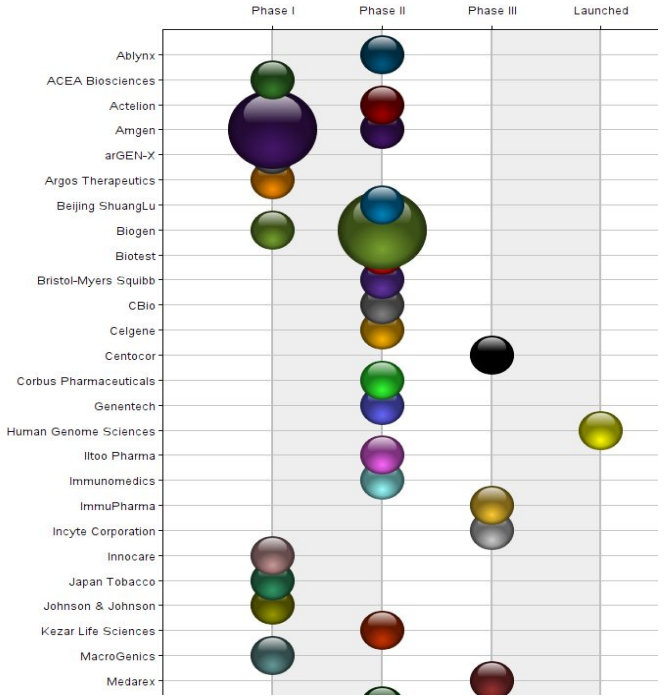


Other Data Visualizations

Word Cloud from List Selection



Bubble Chart



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BizInt Smart Charts
Drug Development Suite

BizInt Smart Charts
Reference Rows™

vantage point
Smart Charts Edition

- ✓ Combination of various sources
- ✓ Helpful to Analyse Pipeline and Clinical Development of our Competitors
- ✓ Some limitations:
  - ✓ Compatibility restriction (for example OncologyPipeline)
  - ✓ Need expertise and time
- ✓ Not usable for Big Data

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Contents

Context

- ✓ Pancreatic cancer is a pathology of interest to many R&D and strategic departments, but it is a new disease within the company
- ✓ The objective is to compile competitive and environmental data on pancreatic cancer in order to obtain a 360° view of the information
- ✓ The project was conducted together with the Digital Factory - IT Department

Our investigations

- ✓ Centralize the data from different sources and data preparation
- ✓ Associate the elements of treatment decision tree to each clinical trial, their investigated drugs and study centers
- ✓ Visualize data via different interactive tools

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Sources | Requests | Results | Combination | Database | Visualization

Adis Insight Pharmaprojects

pipeline

ClinicalTrials.gov
A service of the U.S. National Institutes of Health
Developed by the National Library of Medicine

Trialtrove
Pharma intelligence | informa

Clinical trials

Drug's dictionary coding

"Cancer , Pancreatic & (Phase II) OR(Phase III)OR(Phase IV)OR(Phase III/IV)OR(Phase II/III)OR(Phase I/II)OR(Pre-registration)OR(Registered) OR(Launched)OR(Marketed)"

250 Distinct Drugs

Open Trials
Completed Trials
(completion data > 2016)
Planned Trials
(start data > 2016)

1311 clinical trials

Associate the elements of treatment decision tree to each clinical trial

Database of **1311** of clinical trials & **250** drug details

Visualization Tools

Web-App Solution

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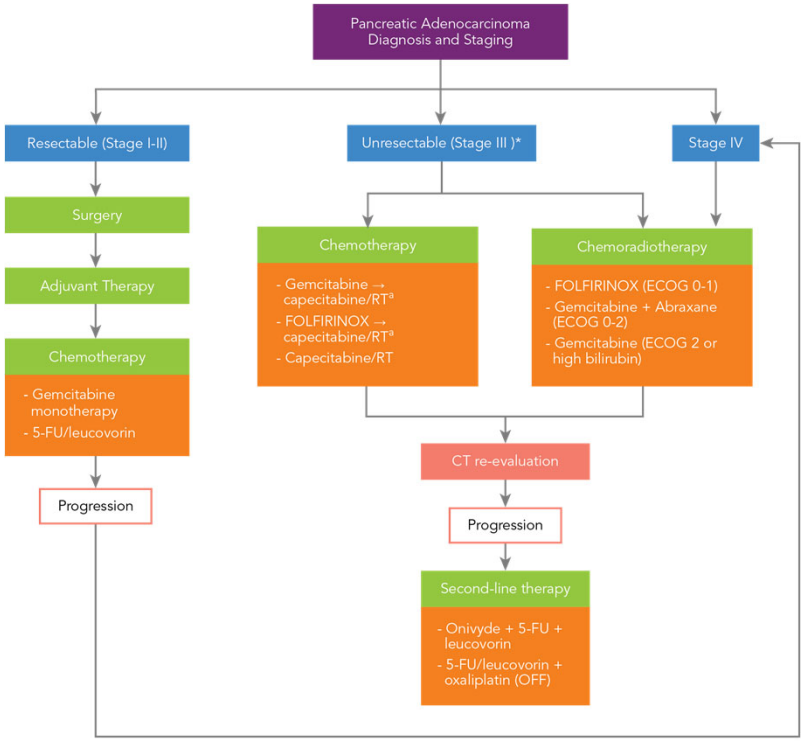
Treatment Decision Tree for Pancreatic Adeno-carcinoma: Europe



[a] Only as neoadjuvant therapy for borderline resectable (stage III).
* Including borderline resectable.

Note: Last updated August 2017

Associate the elements of treatment decision tree to each clinical trial

Line of Therapy or Operation	Stage (Any combination)	Treatment Tree Position
Adjuvant/ Neoadjuvant	0,I,II,III	Resectable
First line	III	Unresectable
First line	IV	First Line Metastatic
Second line or greater/Refractory/Relapsed	III, IV	Second Line
First line Maintenance/Consolidation	III	Unresectable
First line Maintenance/Consolidation	IV	First Line Metastatic
Second line or greater/Refractory/Relapsed	Any stage	Second Line
First line	II,III	Unresectable
First line	Any stage	First Line Metastatic
Line of therapy N/A	IV	First Line Metastatic
Line of therapy N/A	III	Unresectable

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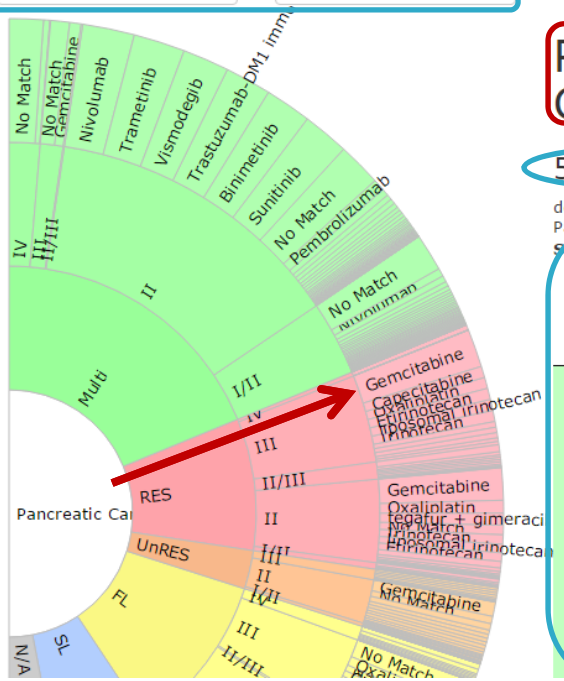
DATAVIZ #1 : The WHEEL

Valem 360

Filter by | Molecule | Phase



Pancreatic Cancer > Resectable > III > Gemcitabine

5293 patients

More details on associated clinical Trials

depth : 3

Pancreatic Cancer > Resectable > III > Gemcitabine

Show 50 entries

Search:

Phase	TrialTrove ID	NCT ID	Title	Status	Primary Endpoints Reported	Sponsor
III	TrialTroveID-269431	NCT02919787	Norwegian Pancreatic Cancer Trial (NorPACT) - 1: Norwegian Multicentre Un-blinded Phase III Randomized Controlled Trial (RCT) Evaluating the Additional Efficacy of Adding Chemotherapy Prior to Resection of a Pancreatic Head Malignancy to Avoid Early Mortality in Those	Open	2021-10-01	["Other Hospital/Academic/M Center"]

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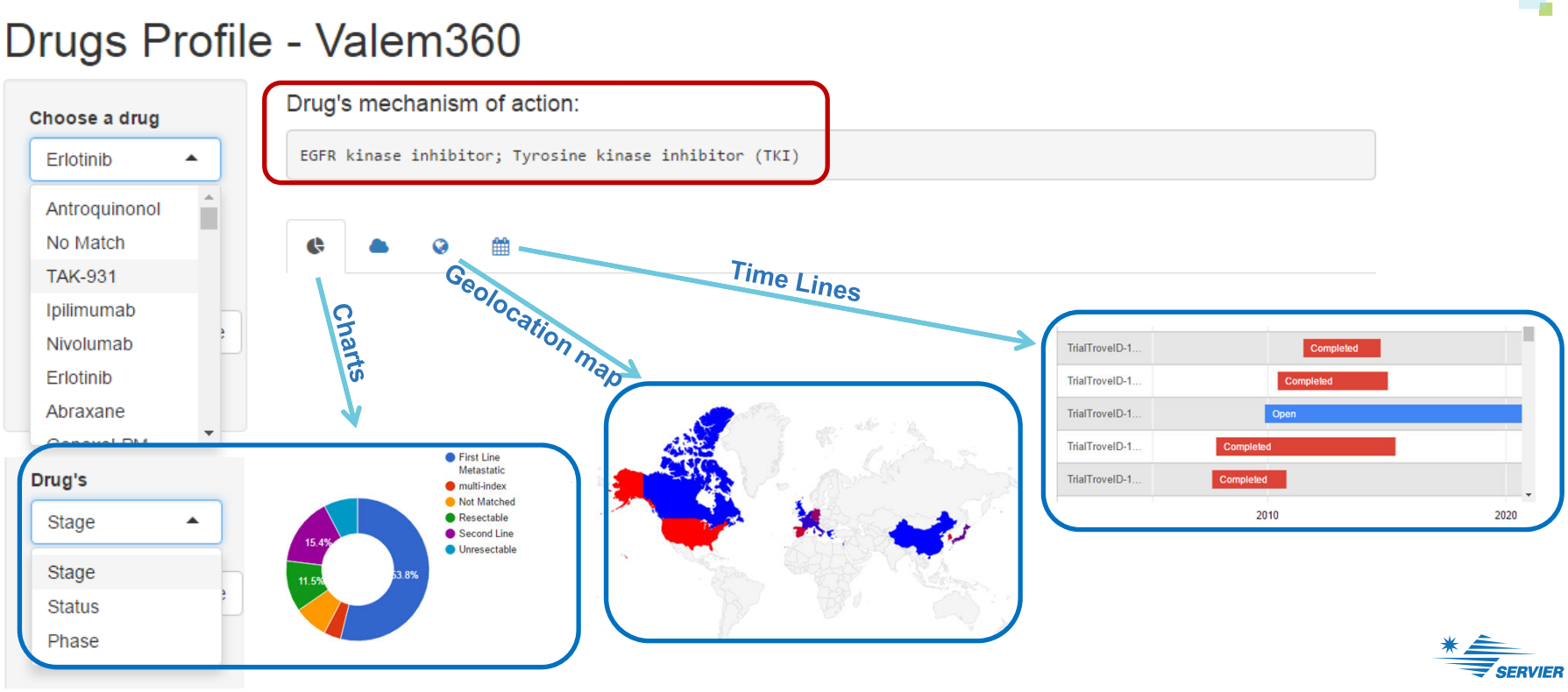
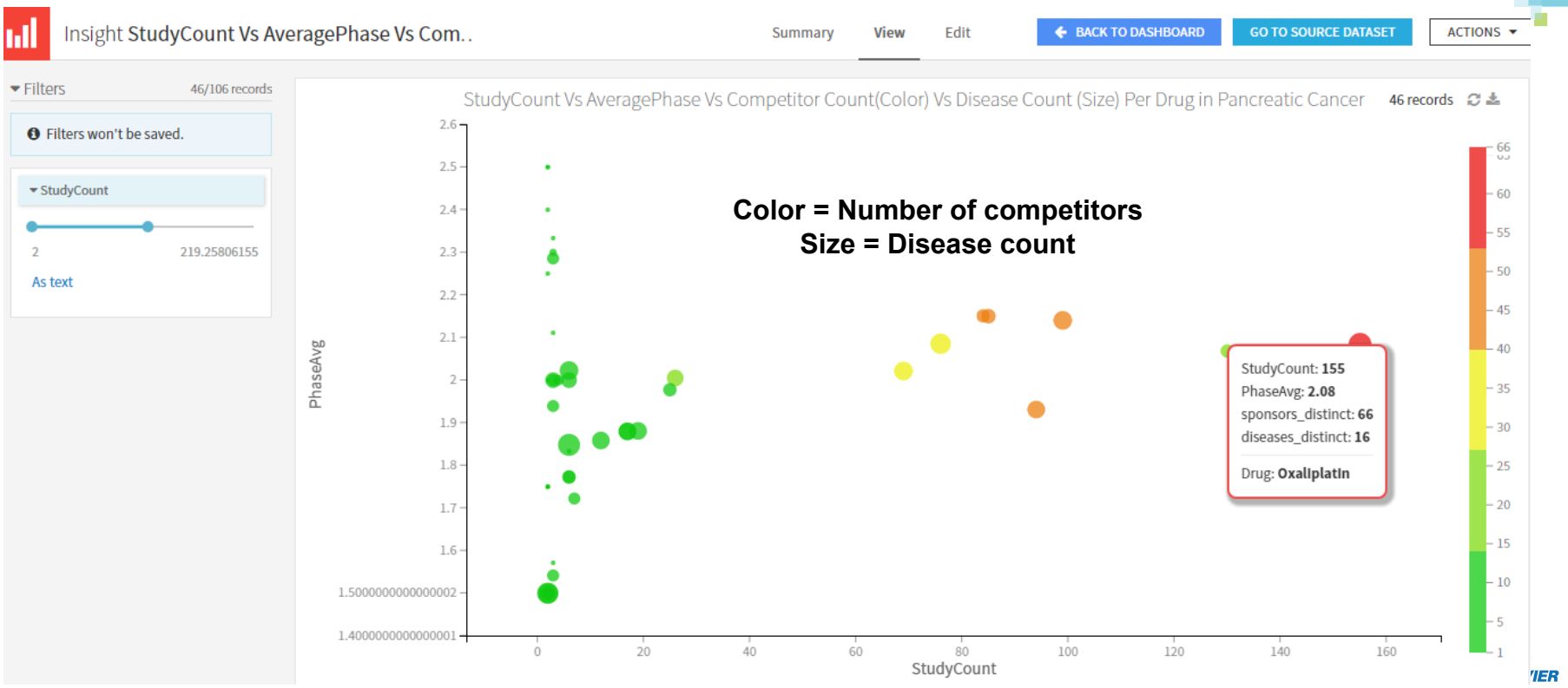
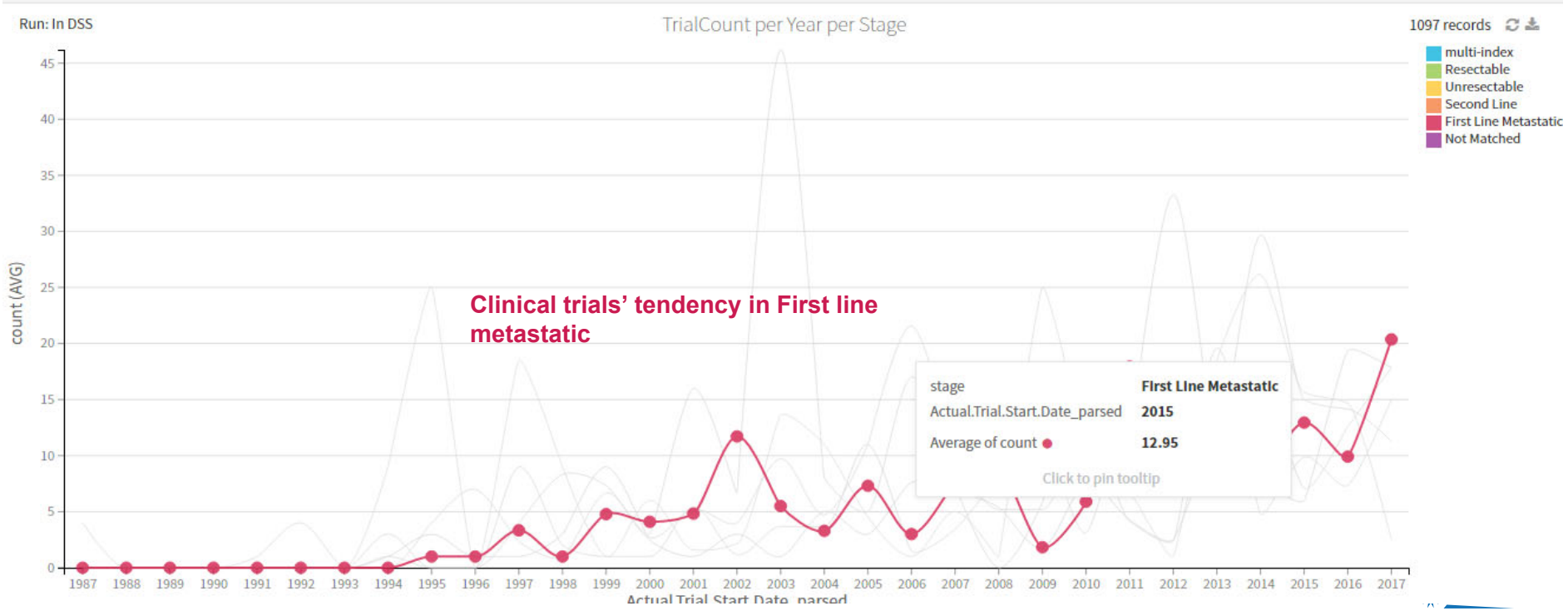
DATAVIZ #2: Dashboard (*Drugs2Trials*)



DATAVIZ #3 : Dashboard (*Drugs**By**StudyCount*)



DATAVIZ #4 : Dashboard (Trials'*stage**Over**Time*)



Take Aways

Interesting and enriching agile working method

This project has taught us:

- ✓ Need to work on structured data
- ✓ Structured data extracted from paid databases such as Pharmaprojects or Trialtrove are of poor quality: content, coverage, update, metadata
- ✓ Need to cross-check the information, to "clean" the data
- ✓ Importance of setting up dynamic dataviz to help us analyze the information

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VALEM 360 : Conclusion & Perspectives

- ✓ Fast implementation of a data-driven approach
- ✓ Provide a competitive landscape database on pancreatic cancer
- ✓ Different interactive data visualization tools

- ✓ Improve semi-automatic to fully automatic (daily – weekly update) data driven approaches. API solutions
- ✓ Improve used methodology based on business feedback
- ✓ Apply the same method to different pathologies

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Conclusion

Data Visualizations for the Analysis of our Competitive Intelligence

- ✓ Very Useful Tools
- ✓ Choose Relevant Representations
- ✓ Need Expertises in Topics, Information Sources and Data Structures.