



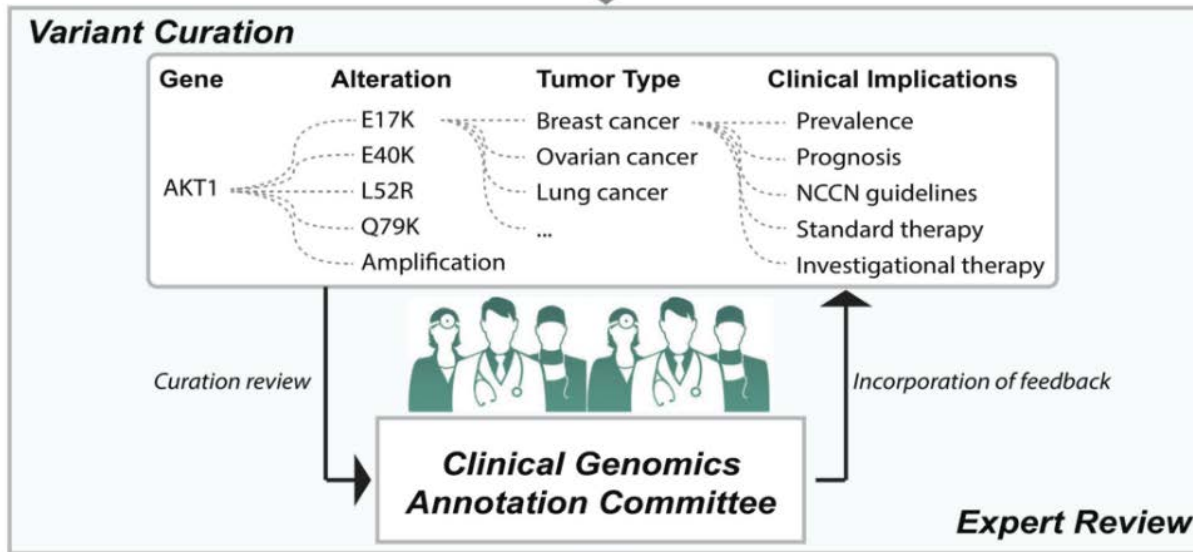
CANCER GENOMICS CONSORTIUM

Educating for Best Practices in Clinical Cancer Genomics

OncKB

<http://oncokb.org/#/>

[Chakravarty et al., JCO PO 2017](#)



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OncKB

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Memorial Sloan Kettering
Cancer Center

OncKB

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Clinical evidence

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Level 4

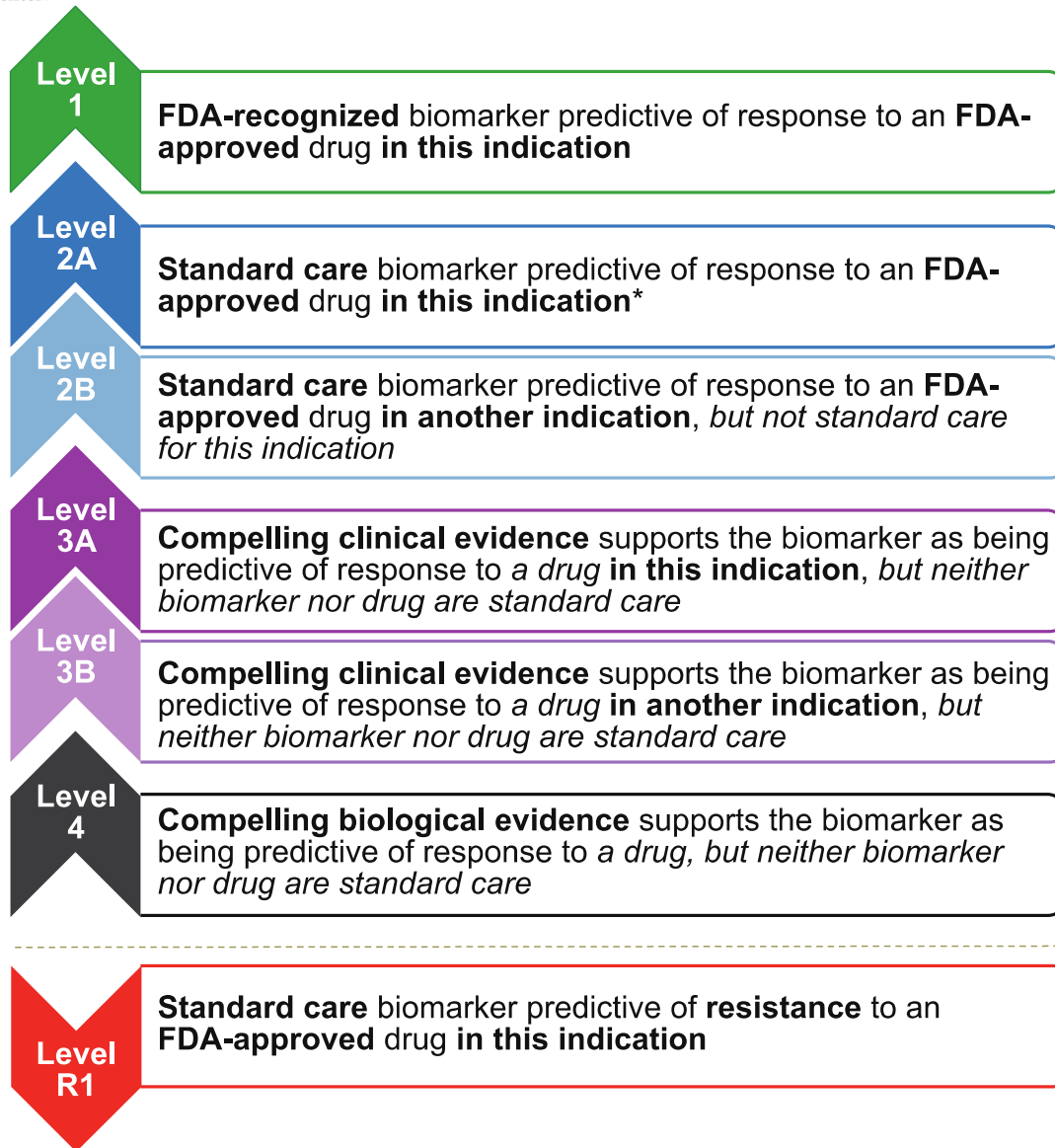
Biological evidence

20 Genes

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MSK Levels of Evidence



Standard Therapeutic Implications

*Includes biomarkers that are recommended as standard care by the NCCN or other expert panels but not necessarily FDA-recognized for a particular indication

Investigational Therapeutic Implications

possibly directed to clinical trials

Hypothetical Therapeutic Implications

based on preliminary, non-clinical data

Standard Therapeutic Implications

OncKB News

- Contains information about updates to the knowledgebase.

OncKB

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While we aim to keep the information up to date and correct, there will inevitably be gaps or mistakes. Please help us to identify any issues by **sending an email to feedback@oncokb.org**, or use the feedback button that appears next to variants in cBioPortal.

Stay tuned for future data updates (improved annotations, new variants), as well as new features. You can follow us on Twitter ([@OncKB](#)) or subscribe to our **low-volume email list** for updates.

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May 15, 2017

- 🔗 Brigatinib FDA-approval in ALK-positive NSCLC added as a new Level 1 association.
- 🔗 Amplification events for most Oncogenes and Deletions or Truncating mutations for most Tumor Suppressor have been annotated/updated.
- 🔗 Inclusion of literature from AACR 2017.
- 🔗 Addition of new variants and updates to existing variant annotations.

April 5, 2017

- 🔗 Curation of 58 additional genes.
- 🔗 Gene alias information added to gene page and search box.

ERBB

ERBB3 (Entrez Gene: 2065)
Also known as: *ErbB-3*, *p180-ErbB3*, *p45-sErbB3*, *LCCS2*, *c-erbB-3*, *c-erbB3*, *p85-sErbB3*, *MDA-MF-1*, *erbB3-S*, *HER3*

ERBB4 (Entrez Gene: 2066)
Also known as: *AL519*, *p180ErbB4*, *HER4*

ERBB2 (Entrez Gene: 2064)
Also known as: *CD340*, *HER2*, *HER2neu*, *HER2*, *HER-2*, *NEU*

EGFR (Entrez Gene: 1956)
Also known as: *FIGF*, *ERBB1*, *meNA*, *ERBB*, *HER1*, *NISGD2*

- 🔗 API updates.
- 🔗 Updated Actionable Genes

Level	Update
Level 1	<ul style="list-style-type: none"> 🔗 BRCA1/2 – Oncogenic Mutations – Ovarian Cancer – Niraparib FDA approval added 🔗 BRCA1/2 – Oncogenic Mutations – Ovarian Cancer – Rucaparib (new publication added) 🔗 Updated variants for KIT – Gastrointestinal Stromal Tumor – Imatinib, Sunitinib, Regorafenib
Level 2	<ul style="list-style-type: none"> 🔗 Updated variants for KIT – Gastrointestinal Stromal Tumor – Nilotinib, Dasatinib, Sorafenib 🔗 Updated variants for KIT – Thymic cancer – Sunitinib, Sorafenib
Level 3	<ul style="list-style-type: none"> 🔗 BRAF V600 – Colorectal Cancer – Encorafenib + Binimetinib + Cetuximab (new association) 🔗 FGFR1 – Amplification – Lung Squamous Cell Carcinoma – AZD4547, Debio1347 (new abstract added) 🔗 FGFR2 – Fusions – Cholangiocarcinoma – BGJ398, Debio1347 (new abstract added) 🔗 Updated variants for FGFR3 – Bladder cancer – JNJ-42756493, Debio1347 🔗 PIK3CA – Oncogenic mutations – Breast cancer – Updated treatments and evidence

Data Access and API

- Can choose to download all variants or actionable variants.
- API is open source – check out the usage terms before incorporating into your own application.

Data Download

OncoKB annotations are fully available for download. Please review the [usage terms](#) before downloading.
When using OncoKB, please cite: [Chakravarty et al., JCO PO 2017](#)

[ALL VARIANTS](#) [ACTIONABLE VARIANTS](#)

Data API

OncoKB, a comprehensive and curated precision oncology knowledge base, offers oncologists detailed, evidence-based information about individual somatic mutations and structural alterations present in patient tumors with the goal of supporting optimal treatment decisions.

Created by OncoKB
See more at <http://www.oncokb.org>
Contact the developer
License: [Usage Terms](#)

Drugs	Open/Hide List operations Expand operations
Evidences	Open/Hide List operations Expand operations
Genes	Open/Hide List operations Expand operations
Variants	Open/Hide List operations Expand operations
Levels	Open/Hide List operations Expand operations
Search	Open/Hide List operations Expand operations
Utils	Open/Hide List operations Expand operations

[BASE URL: /api/v1, API VERSION: v1.0.0, HOST: <http://oncokb.org>] VALID {..}

Actionable Genes

- Categorized Based on Level of Evidence
- Includes links to references on PubMed by hovering over row of interest
- Can search within each level of evidence for any of the fields in the table (disease abbreviations are not recognized)


Level 1 FDA-approved: 12 Genes, 91 Variants

Search:

Gene	Variants	Disease	Drugs	Citations
ABL1	BCR-ABL1 Fusion	Acute Lymphoid Leukemia	Dasatinib	2 references
ABL1	BCR-ABL1 Fusion	Acute Lymphoid Leukemia	Imatinib	2 references
ABL1	BCR-ABL1 Fusion	Chronic Myelogenous Leukemia	Dasatinib	2 references
ABL1	BCR-ABL1 Fusion	Chronic Myelogenous Leukemia	Imatinib	3 references
ABL1	BCR-ABL1 Fusion	Chronic Myelogenous Leukemia	Nilotinib	2 references
ALK	Fusions	Non-Small Cell Lung Cancer	Alectinib	2 references
ALK	Fusions	Non-Small Cell Lung Cancer	Crizotinib	2 references
ALK	Fusions	Non-Small Cell Lung Cancer	Crizotinib	1 reference
ALK	Oncogenic Mutations	Non-Small Cell Lung Cancer	Brigatinib	4 references
BRAF	V600D, V600E, V600G, V600K, V600M, V600R	Melanoma	Cobimetinib+Vemurafenib	1 references
BRAF	V600D, V600E, V600G, V600K, V600M, V600R	Melanoma	Dabrafenib	5 references
BRAF	V600D, V600E, V600G, V600K,	Melanoma	Dabrafenib+Trametinib	7 references

Showing 1 to 52 of 52 entries

Viewing/Searching all Genes

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- Two ways to search genes
 - Search bar on home screen
 - Click on # Genes on home page – can also browse genes using this approach

Browsing Genes

- Click on number of genes on home page representing all the genes in the knowledgebase.
- Click on gene name to bring up gene page.
- For level of evidence definitions, see slide 4.

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Search:

Gene	Highest Level of Evidence	# of Variants
ABL1	1	29
ALK	1	78
BRAF	1	105
BRCA1	1	294
BRCA2	1	140
EGFR	1	158
ERBB2	1	77
KIT	1	111
KRAS	1	50
PDGFRA	1	68
PDGFRB	1	27
ROS1	1	29
NRAS	R1	15
CDK4	2A	4

Showing 1 to 476 of 476 entries

Gene Page

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ROS1 | 28 annotated variants

ROS1

Oncogene
Highest level of evidence: Level 1
Also known as MCF3, ROS, c-ros-1
Isoform: ENST00000368508 RefSeq: NM_002944.2

ROS1, a receptor tyrosine kinase, is altered by mutation or chromosomal rearrangement in a diverse range of cancers, including lung cancer.
See *ROS1 background*

Annotated Mutation Distribution across 20 Disease Specific Studies

● 1.7% of patients have annotated ROS1 mutation in Lung Adenocarcinoma (TCGA, Nature 2014)

Clinically Relevant Variants (2) All Annotated Variants (28)

If you notice any mistakes or missing variants / citations, please send an email to feedback@oncokb.org.

Search: _____

Variant	Cancer Type	Drug(s)	Level	Citations
Fusions	Non-Small Cell Lung Cancer	Crizotinib	1	1 reference
D2033N	Non-Small Cell Lung Cancer	Cabozantinib	3A	1 reference

Hover over reference column for links to PubMed

All Annotated Variants Tab

- Contains all annotated variants in the database for a given gene.
- Sort by any of the columns in the table.
- Search for any item in the table.
- Missing a variant that you know of?
 - Email feedback@oncokb.org with your suggestions.

Variant	Oncogenic	Mutation Effect	Citations
SLC34A2-ROS1 Fusion	Yes	Gain-of-function	3 references
CD74-ROS1 Fusion	Yes	Gain-of-function	4 references

Scenario #1

- You are making a list of actionable genes to flag in laboratory reports.
 - Obtain list of actionable genes.

Download all Actionable Variants

- Click on Data Access from Home page
- Read usage terms
- Download “Actionable Variants”
- Copy/paste contents into Excel for readability
- Incorporate API if applicable your lab’s interface to link to actionable variants on OncoKB.

Scenario #2

- You are creating a Pan Cancer List for your laboratory.
 - Obtain entire list of genes annotated in OncoKB.

Download All Variants

- Click on 'Data Access' from Home Page.
- Read usage terms
- Click on blue button to download "All Variants"
- Copy/paste entire contents of .txt document into Excel if needed for ease of use.
- Incorporate into your list

Scenario #3

- You are making a custom NGS panel for lung cancer and want to make sure you have incorporated this resource's information on actionable variants.

Find Actionable Lung Cancer Genes

- Option #1: Actionable Genes tab
 - Click on 'Actionable Genes' from the home page and sort using search term "Lung" for each Evidence level.
 - Manually extract the desired genes from this page.
- Option #2: Download Actionable Variants
 - Filter downloaded Actionable Variants information by Cancer type.

Scenario #4

- Your laboratory is publishing a large genomic study identifying new variants that will be pushed into clinical trials.
 - Email feedback@oncokb.org with the publication/abstract information so they can incorporate the new information into a future update.

Contacts

- team@oncokb.org
- feedback@oncokb.org