OncoKB

http://oncokb.org/#/

Chakravarty et al., JCO PO 2017
Educating for best practices in clinical cancer genomics
MSK Levels of Evidence

Level 1
FDA-recognized biomarker predictive of response to an FDA-approved drug in this indication

Level 2A
Standard care biomarker predictive of response to an FDA-approved drug in this indication*

Level 2B
Standard care biomarker predictive of response to an FDA-approved drug in another indication, but not standard care for this indication

Level 3A
Compelling clinical evidence supports the biomarker as being predictive of response to a drug in this indication, but neither biomarker nor drug are standard care

Level 3B
Compelling clinical evidence supports the biomarker as being predictive of response to a drug in another indication, but neither biomarker nor drug are standard care

Level 4
Compelling biological evidence supports the biomarker as being predictive of response to a drug, but neither biomarker nor drug are standard care

Level R1
Standard care biomarker predictive of resistance to an FDA-approved drug in this indication

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

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OncoKB News

- Contains information about updates to the knowledgebase.

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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

[BASE URL: /api/v1, API VERSION: v1.0.0, HOST: http://oncokb.org]
## 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

<table>
<thead>
<tr>
<th>Gene</th>
<th>Variants</th>
<th>Disease</th>
<th>Drugs</th>
<th>Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABL1</td>
<td>BCR-ABL1 Fusion</td>
<td>Acute Lymphoid Leukemia</td>
<td>Dasatinib</td>
<td>2 references</td>
</tr>
<tr>
<td>ABL1</td>
<td>BCR-ABL1 Fusion</td>
<td>Acute Lymphoid Leukemia</td>
<td>Imatinib</td>
<td>2 references</td>
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<td>Nilotinib</td>
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</tr>
<tr>
<td>ALK</td>
<td>Fusions</td>
<td>Non-Small Cell Lung Cancer</td>
<td>Alretinib</td>
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<td>Non-Small Cell Lung Cancer</td>
<td>Crizotinib</td>
<td>2 references</td>
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<tr>
<td>ALK</td>
<td>Fusions</td>
<td>Non-Small Cell Lung Cancer</td>
<td>Crizotinib</td>
<td>1 references</td>
</tr>
<tr>
<td>ALK</td>
<td>Oncogenic Mutations</td>
<td>Non-Small Cell Lung Cancer</td>
<td>Brigatinib</td>
<td>4 references</td>
</tr>
<tr>
<td>BRAF</td>
<td>V600D, V600E, V600G, V600K,</td>
<td>Melanoma</td>
<td>Cobimatinib+Vemurafenib</td>
<td>1 references</td>
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<tr>
<td></td>
<td>V600M, V600R</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>V600D, V600E, V600G, V600K,</td>
<td>Melanoma</td>
<td>Dabrafenib</td>
<td>5 references</td>
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<tr>
<td></td>
<td>V600M, V600R</td>
<td></td>
<td></td>
<td></td>
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<td>Melanoma</td>
<td>Dabrafenib+Trametinib</td>
<td>7 references</td>
</tr>
<tr>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Showing 1 to 52 of 52 entries
Viewing/Searching all Genes

- 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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Hover over mutation markers for AA Change

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.

<table>
<thead>
<tr>
<th>Variant</th>
<th>Oncogenic</th>
<th>Mutation Effect</th>
<th>Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLC34A2-ROS1 Fusion</td>
<td>Yes</td>
<td>Gain-of-function</td>
<td>3 references</td>
</tr>
<tr>
<td>CD74-ROS1 Fusion</td>
<td>Yes</td>
<td>Gain-of-function</td>
<td>4 references</td>
</tr>
</tbody>
</table>
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.

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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