

Table 1. Classification of the most commonly mutated cancer genes as Tumor suppressor gene (TsG) or Oncogene based on 4 sources: OncoKb, Vanderbilt TSGene 2.0, Vogelstein et al 2013, and IntOGen.

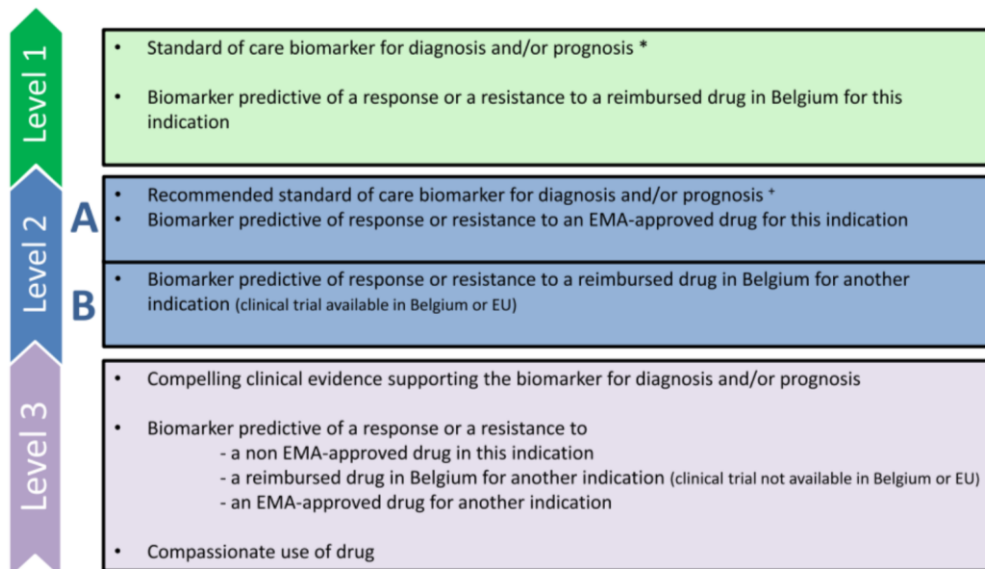
| HugoSymbol | OncoKb 2019 | Vanderbilt 2019 | Vogelstein 2013 | IntOGen 2019 | Merge |
|------------|-------------|-----------------|-----------------|--------------|--------------|
| ABL1 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| ACVR1 | Oncogene | | | | Oncogene |
| ACVR1B | | | TsG | | TsG |
| AKT1 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| AKT2 | Oncogene | Oncogene | | | Oncogene |
| AKT3 | Oncogene | | | | Oncogene |
| ALK | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| AMER1 | TsG | | | TsG | TsG |
| ANKRD11 | TsG | | | | TsG |
| APC | TsG | TsG | TsG | TsG | TsG |
| AR | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| ARAF | Oncogene | Oncogene | | Oncogene | Oncogene |
| ARID1A | TsG | TsG | TsG | TsG | TsG |
| ARID1B | TsG | | TsG | TsG | TsG |
| ARID2 | TsG | TsG | TsG | TsG | TsG |
| ARID5B | TsG | | | | TsG |
| ASXL1 | TsG | TsG | TsG | TsG | TsG |
| ASXL2 | TsG | | | TsG | TsG |
| ATM | TsG | TsG | TsG | TsG | TsG |
| ATR | TsG | TsG | | | TsG |
| ATRX | TsG | | TsG | TsG | TsG |
| AURKA | Oncogene | Oncogene | | | Oncogene |
| AURKB | Oncogene | | | | Oncogene |
| AXIN1 | TsG | TsG | TsG | TsG | TsG |
| AXIN2 | TsG | TsG | | TsG | TsG |
| AXL | Oncogene | Oncogene | | | Oncogene |
| B2M | TsG | | TsG | TsG | TsG |
| BAP1 | TsG | TsG | TsG | TsG | TsG |
| BARD1 | TsG | TsG | | | TsG |
| BCL10 | TsG | TsG | | | TsG |
| BCL2 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| BCL2L11 | TsG | | | | TsG |
| BCL6 | Oncogene | Oncogene | | Oncogene | Oncogene |
| BCOR | TsG | | TsG | TsG | TsG |
| BLM | TsG | TsG | | | TsG |
| BRAF | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| BRCA1 | TsG | TsG | TsG | TsG | TsG |
| BRCA2 | TsG | TsG | TsG | TsG | TsG |
| BRD4 | Oncogene | | | Oncogene | Oncogene |
| BTK | Oncogene | | | Oncogene | Oncogene |
| CALR | Oncogene | | | | Oncogene |
| CARD11 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| CASP8 | TsG | TsG | TsG | TsG | TsG |
| CBL | TsG | Oncogene | Oncogene | Oncogene | Oncogene/TsG |
| CCND1 | Oncogene | Oncogene | | Oncogene | Oncogene |
| CCND2 | Oncogene | | | Oncogene | Oncogene |
| CCND3 | Oncogene | | | Oncogene | Oncogene |
| CCNE1 | Oncogene | | | | Oncogene |
| CDC73 | TsG | TsG | TsG | TsG | TsG |
| CDH1 | TsG | TsG | TsG | TsG | TsG |

| | | | | | |
|---------|--------------|--------------|----------|----------|--------------|
| CDK4 | Oncogene | | | Oncogene | Oncogene |
| CDK6 | Oncogene | | | | Oncogene |
| CDKN1A | TsG | TsG | | TsG | TsG |
| CDKN1B | TsG | Oncogene | | TsG | Oncogene/TsG |
| CDKN2A | TsG | TsG | TsG | TsG | TsG |
| CDKN2B | TsG | TsG | | | TsG |
| CDKN2C | TsG | TsG | | TsG | TsG |
| CEBPA | TsG | TsG | TsG | | TsG |
| CHEK1 | TsG | TsG | | | TsG |
| CHEK2 | TsG | TsG | | TsG | TsG |
| CIC | TsG | | TsG | TsG | TsG |
| CREBBP | TsG | TsG | TsG | TsG | TsG |
| CRKL | Oncogene | | | | Oncogene |
| CRLF2 | Oncogene | Oncogene | Oncogene | | Oncogene |
| CSF1R | | Oncogene | Oncogene | | Oncogene |
| CSF3R | Oncogene | | | Oncogene | Oncogene |
| CTCF | TsG | TsG | | TsG | TsG |
| CTLA4 | Oncogene | | | | Oncogene |
| CTNNB1 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| CYLD | TsG | TsG | TsG | TsG | TsG |
| DAXX | TsG | | TsG | TsG | TsG |
| DDR2 | Oncogene | | | | Oncogene |
| DNMT1 | Oncogene | Oncogene | Oncogene | | Oncogene |
| DNMT3A | TsG | Oncogene | Oncogene | TsG | Oncogene/TsG |
| E2F3 | Oncogene | | | | Oncogene |
| EGFR | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| EP300 | TsG | | TsG | TsG | TsG |
| ERBB2 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| ERBB3 | Oncogene | | | Oncogene | Oncogene |
| ERBB4 | Oncogene | TsG | | TsG | Oncogene/TsG |
| ERCC2 | TsG | | | TsG | TsG |
| ERCC3 | TsG | | | TsG | TsG |
| ERCC4 | TsG | | | | TsG |
| ERF | TsG | TsG | | | TsG |
| ERG | Oncogene | Oncogene | | Oncogene | Oncogene |
| ERRFI1 | TsG | TsG | | | TsG |
| ESR1 | Oncogene | | | Oncogene | Oncogene |
| ETV1 | Oncogene | Oncogene | | | Oncogene |
| ETV6 | TsG | Oncogene/TsG | | Oncogene | Oncogene/TsG |
| EWSR1 | Oncogene | Oncogene | | Oncogene | Oncogene |
| EZH2 | Oncogene/TsG | Oncogene | Oncogene | TsG | Oncogene/TsG |
| FAM123B | | TsG | TsG | | TsG |
| FANCA | TsG | | | TsG | TsG |
| FANCC | TsG | | | | TsG |
| FAT1 | TsG | TsG | | TsG | TsG |
| FBXW7 | TsG | TsG | TsG | TsG | TsG |
| FGF19 | Oncogene | | | | Oncogene |
| FGF3 | Oncogene | Oncogene | | | Oncogene |
| FGF4 | Oncogene | Oncogene | | | Oncogene |
| FGFR1 | Oncogene | | | Oncogene | Oncogene |
| FGFR2 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| FGFR3 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| FGFR4 | Oncogene | | | Oncogene | Oncogene |
| FH | TsG | TsG | | | TsG |
| FLT1 | Oncogene | | | | Oncogene |
| FLT3 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| FLT4 | Oncogene | | | | Oncogene |
| FOXA1 | Oncogene/TsG | | | TsG | Oncogene/TsG |

| | | | | | |
|----------|--------------|--------------|----------|----------|--------------|
| FOXL2 | Oncogene/TsG | Oncogene | Oncogene | Oncogene | Oncogene/TsG |
| FUBP1 | TsG | | TsG | TsG | TsG |
| GATA1 | | | TsG | Oncogene | Oncogene/TsG |
| GATA2 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| GATA3 | Oncogene/TsG | | TsG | TsG | Oncogene/TsG |
| GLI1 | Oncogene | Oncogene | | Oncogene | Oncogene |
| GNA11 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| GNAQ | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| GNAS | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| H3F3A | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| HGF | Oncogene | | | | Oncogene |
| HIST1H3B | | Oncogene | Oncogene | Oncogene | Oncogene |
| HLA-A | TsG | | | | TsG |
| HLA-B | TsG | | | | TsG |
| HNF1A | TsG | | TsG | TsG | TsG |
| HRAS | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| IDH1 | Oncogene | Oncogene/TsG | Oncogene | Oncogene | Oncogene/TsG |
| IDH2 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| IGF1 | Oncogene | | | | Oncogene |
| IGF1R | Oncogene | | | | Oncogene |
| IGF2 | Oncogene | | | | Oncogene |
| INPP4B | TsG | TsG | | | TsG |
| IRS2 | Oncogene | | | | Oncogene |
| JAK1 | Oncogene/TsG | Oncogene | Oncogene | | Oncogene/TsG |
| JAK2 | Oncogene | Oncogene | Oncogene | | Oncogene |
| JAK3 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| JUN | Oncogene | Oncogene | | | Oncogene |
| KDM5C | TsG | | TsG | TsG | TsG |
| KDM6A | TsG | | TsG | TsG | TsG |
| KDR | Oncogene | | | Oncogene | Oncogene |
| KEAP1 | TsG | | | Oncogene | Oncogene/TsG |
| KIT | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| KLF4 | Oncogene/TsG | Oncogene/TsG | Oncogene | Oncogene | Oncogene/TsG |
| KMT2A | TsG | Oncogene | | TsG | Oncogene/TsG |
| KMT2B | TsG | | | TsG | TsG |
| KMT2C | TsG | | | TsG | TsG |
| KMT2D | TsG | | | TsG | TsG |
| KRAS | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| MAP2K1 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| MAP2K4 | TsG | TsG | | TsG | TsG |
| MAP3K1 | TsG | | TsG | TsG | TsG |
| MAPK1 | Oncogene | | | Oncogene | Oncogene |
| MDM2 | Oncogene | Oncogene | | Oncogene | Oncogene |
| MDM4 | Oncogene | | | | Oncogene |
| MED12 | Oncogene/TsG | Oncogene | Oncogene | Oncogene | Oncogene/TsG |
| MEF2B | Oncogene | | | TsG | Oncogene/TsG |
| MEN1 | TsG | TsG | TsG | TsG | TsG |
| MET | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| MGA | TsG | | | TsG | TsG |
| MLH1 | TsG | TsG | TsG | | TsG |
| MLL2 | | | TsG | | TsG |
| MLL3 | | | TsG | | TsG |
| MPL | Oncogene | Oncogene | Oncogene | | Oncogene |
| MSH2 | TsG | TsG | TsG | | TsG |
| MSH6 | TsG | | TsG | | TsG |
| MTOR | Oncogene | | | Oncogene | Oncogene |
| MYC | Oncogene | Oncogene | | Oncogene | Oncogene |
| MYCN | Oncogene | Oncogene | | Oncogene | Oncogene |

| | | | | | |
|---------|--------------|--------------|----------|--------------|--------------|
| MYD88 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| NCOR1 | TsG | | TsG | TsG | TsG |
| NF1 | TsG | TsG | TsG | TsG | TsG |
| NF2 | TsG | TsG | TsG | TsG | TsG |
| NFE2L2 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| NFKBIA | TsG | | | TsG | Oncogene |
| NOTCH1 | Oncogene/TsG | Oncogene/TsG | TsG | Oncogene/TsG | Oncogene/TsG |
| NOTCH2 | Oncogene/TsG | Oncogene | TsG | Oncogene/TsG | Oncogene/TsG |
| NPM1 | TsG | Oncogene | TsG | Oncogene/TsG | Oncogene/TsG |
| NRAS | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| NTRK1 | Oncogene | Oncogene | | Oncogene | Oncogene |
| NTRK2 | Oncogene | | | | Oncogene |
| NTRK3 | Oncogene | | | Oncogene | Oncogene |
| PARP1 | TsG | | | | Oncogene |
| PAX5 | TsG | Oncogene/TsG | TsG | | Oncogene/TsG |
| PAX8 | Oncogene | | | | Oncogene |
| PBRM1 | TsG | TsG | TsG | TsG | TsG |
| PDGFRA | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| PDGFRB | Oncogene | Oncogene | | Oncogene | Oncogene |
| PHF6 | TsG | TsG | TsG | TsG | TsG |
| PIK3CA | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| PIK3CB | Oncogene | | | Oncogene | Oncogene |
| PIK3CD | Oncogene | | | | Oncogene |
| PIK3CG | Oncogene | | | | Oncogene |
| PIK3R1 | TsG | | TsG | TsG | TsG |
| PIK3R3 | TsG | | | | TsG |
| PMS1 | TsG | TsG | | | TsG |
| POLD1 | TsG | | | Oncogene | Oncogene/TsG |
| POLE | TsG | | | | TsG |
| PPM1D | Oncogene | | | TsG | Oncogene/TsG |
| PPP2R1A | TsG | Oncogene | Oncogene | Oncogene | Oncogene |
| PPP6C | TsG | | | TsG | TsG |
| PRDM1 | TsG | TsG | TsG | TsG | TsG |
| PRKCI | Oncogene | Oncogene/TsG | | | Oncogene/TsG |
| PTCH1 | TsG | TsG | TsG | TsG | TsG |
| PTEN | TsG | TsG | TsG | TsG | TsG |
| PTPN11 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| RAC1 | Oncogene | | | Oncogene | Oncogene |
| RAD21 | TsG | | | TsG | TsG |
| RAD50 | TsG | | | | TsG |
| RAD51 | TsG | | | | TsG |
| RAD51C | TsG | TsG | | | TsG |
| RAD51D | TsG | | | | TsG |
| RAF1 | Oncogene | Oncogene | | Oncogene | Oncogene |
| RASA1 | TsG | Oncogene | | TsG | Oncogene/TsG |
| RB1 | TsG | Oncogene/TsG | TsG | TsG | Oncogene/TsG |
| RBM10 | TsG | | | TsG | TsG |
| RET | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| RHEB | Oncogene | | | | Oncogene |
| RHOA | Oncogene | Oncogene/TsG | | Oncogene | Oncogene/TsG |
| RICTOR | Oncogene | | | | Oncogene |
| RIT1 | Oncogene | | | | Oncogene |
| RNF43 | TsG | | TsG | TsG | TsG |
| ROS1 | Oncogene | Oncogene | | | Oncogene |
| RPTOR | Oncogene | | | | Oncogene |
| RRAS2 | Oncogene | Oncogene | | Oncogene | Oncogene |
| RUNX1 | TsG | Oncogene | TsG | | TsG |
| RYBP | TsG | | | | TsG |

| | | | | | |
|---------|--------------|--------------|----------|----------|--------------|
| SDHA | TsG | TsG | | | TsG |
| SDHB | TsG | TsG | | | TsG |
| SDHC | TsG | | | | TsG |
| SDHD | TsG | TsG | | | TsG |
| SETBP1 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| SETD2 | TsG | | TsG | TsG | TsG |
| SF3B1 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| SHQ1 | TsG | | | | TsG |
| SMAD2 | TsG | TsG | TsG | TsG | TsG |
| SMAD3 | TsG | TsG | | TsG | TsG |
| SMAD4 | TsG | TsG | TsG | TsG | TsG |
| SMARCA4 | TsG | TsG | TsG | TsG | TsG |
| SMARCB1 | TsG | TsG | TsG | TsG | TsG |
| SMO | Oncogene | Oncogene/TsG | Oncogene | Oncogene | Oncogene/TsG |
| SOCS1 | TsG | TsG | TsG | TsG | TsG |
| SOX17 | TsG | | | Oncogene | TsG |
| SOX9 | Oncogene/TsG | | TsG | TsG | Oncogene/TsG |
| SPEN | TsG | | | | TsG |
| SPOP | TsG | Oncogene | Oncogene | Oncogene | Oncogene/TsG |
| SRC | Oncogene | Oncogene | | | Oncogene |
| SRSF2 | | Oncogene | Oncogene | Oncogene | Oncogene |
| STAG2 | TsG | | TsG | TsG | TsG |
| STAT3 | Oncogene | | | | Oncogene |
| STK11 | TsG | TsG | TsG | TsG | TsG |
| TCF7L2 | TsG | TsG | | Oncogene | Oncogene/TsG |
| TERT | Oncogene | | | | Oncogene |
| TET2 | TsG | TsG | TsG | TsG | TsG |
| TGFBR1 | TsG | | | | TsG |
| TGFBR2 | TsG | TsG | | TsG | TsG |
| TMPRSS2 | | | | | Oncogene |
| TNFAIP3 | TsG | TsG | TsG | TsG | TsG |
| TOP1 | TsG | Oncogene | | TsG | Oncogene/TsG |
| TP53 | TsG | TsG | TsG | TsG | TsG |
| TP53BP1 | TsG | | | | TsG |
| TRAF7 | | | TsG | | TsG |
| TSC1 | TsG | TsG | TsG | TsG | TsG |
| TSC2 | TsG | TsG | | TsG | TsG |
| TSHR | Oncogene | Oncogene | Oncogene | | Oncogene |
| U2AF1 | Oncogene | Oncogene | Oncogene | Oncogene | Oncogene |
| VHL | TsG | TsG | TsG | TsG | TsG |
| WT1 | Oncogene/TsG | Oncogene/TsG | TsG | TsG | Oncogene/TsG |
| XRCC2 | TsG | | | | TsG |
| YAP1 | Oncogene | Oncogene/TsG | | | Oncogene/TsG |



* Standard of care: Included in guidelines (WHO...) AND consensus from experts ComPerMed

* Recommended standard of care: Clinical evidence AND consensus from experts ComPerMed

Figure S1. Definition of levels for diagnostic/prognostic or therapeutic biomarkers and molecular tests, according to the Belgian healthcare system. Taken with permission from Hébrant et al., Belg. J. Med. Oncol. 2018 [1].

References

- 1 Hébrant, A.; Van Valckenborgh, E.; Salgado, R.; Froyen, G.; Hulstaert, F.; Roberfroid, D.; Tejpar, S.; Jouret-Mourin, A.; Van den Bulcke, M.; Waeytens, A. Opportunities and challenges in oncology and molecular testing: the Belgian strategy. *Belg. J. Med. Oncol.* 2018, *12*, 46–50.