

Supplement Table S1. Included studies characteristics regarding methods of molecular analysis and funding sources/ competing interest.

| No | Authors, Year | Follow-Up Duration (years) | Method of BRAF analysis | Funding Sources & Authors conflict of Interest |
|----|------------------------|----------------------------------|---|---|
| 1 | Alzahrani[17], 2017 | 1.2-16 | PCR/ Direct sequencing | This research did not receive any specific grant from any funding agency in the public, commercial or not-for-profit sector. |
| 2 | Ballester[24], 2016 | NR | RT PCR assay | NR |
| 3 | Buryk[25], 2013 | NR | PCR and post-PCR fluorescence melting curve analysis | No conflict of interest to disclose. |
| 4 | Cordioli[16], 2017 | NR | PCR sequencing | Research grants 2013/03867-5 and 2015/60330-8 from The São Paulo State Research Foundation (FAPESP) and grant 470441/2013-5 The São Paulo State Research Foundation (FAPESP) and grant 470441/2013-5 The São Paulo State Research Foundation (FAPESP) and grant 470441/2013-5 from The Brazilian Research Council (CNPq). LM and AUB are recipients of fellowships from FAPESP. JMC is a recipient of a scholarship of Research Productivity from CNPq |
| 5 | Espadinha[26], 2009 | NR | automatic sequencing of PCR products (QRT-PCR/ direct sequencing) | NR |
| 6 | Franco[27], 2022 | NR | sequencing | Supported in part by a grant from NIH R01CA214511 (A.T.F.), The Children's Hospital of Philadelphia Frontier Programs (A.T.F., J.C.R.-F., A.I., S.M.-M., L.S., E.R., and A.J.B.), and the Children's Hospital of Philadelphia Foerderer Grant (J.C.R.-F.). |
| 7 | Geng[18], 2017 | NR | qRT-PCR | The author(s) declare that they have no conflict of interest. This work was supported in part by Beijing Municipal Administration of Hospitals Clinical Medicine Development of Special Funding Support (ZYLX201508), Beijing Municipal Science and Technology Project (D131100005313014), and Beijing Health System Top Level Health Technical Personnel Training Plan (20153079). |
| 8 | Gertz[15], 2016 | 2.6 ±1.58 | Sanger sequencing | The authors wish to thank the University of Wisconsin. Translation Research Initiatives in Pathology Laboratory, in part supported by the University of Wisconsin Department of Pathology and Laboratory Medicine, in Madison, and University of Wisconsin Carbone Cancer Center grant P30 CA014520, for use of its facilities and services. Funding was provided by the Department of Pathology and Laboratory Medicine at the University of Wisconsin, Madison. |
| 9 | Givens[13], 2014 | NR | pyrosequencing PCR | The authors have no funding, financial relationships, or conflicts of interest to disclose |

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| 10 | Hardee[20], 2017 | 1-12 | PCR primers, single strand conformational polymorphism (SSCP) | The author(s) received no financial support for the research, author-ship, and/or publication of this article. The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. |
| 11 | Henke[12], 2014 | 5.5–38.8 | restriction fragment length polymorphism (RFLP) analysis ,PCR | NR |
| 12 | Hess[28], 2022 | 10 | next generation sequencing analysis | No competing financial interests exist. This study was supported by a Learner’s Research Fund grant at Phoenix Children’s Hospital awarded to Jennifer Hess. |
| 13 | Kumagai[11], 2004 | NR | PCR/ direct sequencing | This work was supported by Grants-in-Aid for Scientific Research 13671158, 14380256, 14406017, and 15590981 and the 21st Century COE Program “International Consortium for Medical Care of Hibakusha and Radiation Life Science” from the Ministry of Education, Culture, Sports, Science, and Technology |
| 14 | Kure[29], 2019 | 1-8 | real-time PCR using allele specific primers | This study was funded by the Japanese Association of University Women [the 66th Homes Scholarship, 2014]; and the Children’s Cancer Association of Japan [2017–2019]. The authors declare that there is no conflict of interest. |
| 15 | Kurt[30], 2012 | NR | restriction fragment length polymorphism (RFLP) | The authors would like to thank to Scientific and Technological Research Council of Turkey (TUBITAK) for their support (Grant No: 19816) |
| 16 | Lee[31], 2021 | 0.3-37.3 | BRAF IHC or sequencing | The Ministry of Science, ICT and Future Planning (NRF-2016R1A2B4012417 and 2019R1A2C2084332); the Korean Ministry of Health and Welfare (H14C1277); the Ministry of Education (2020R1A6A1A03047972); and the SNUH Research Fund (04-2015-0830). |
| 17 | Li[7], 2022 | 0.08-4 | real-time PCR using allele specific primers | NR |
| 18 | Macerola[32], 2021 | NR | real time PCR and high-resolution melt analysis | Reagents and consumables were obtained with funds from the University of Pisa |
| 19 | Mitsutake[33], 2015 | NR | direct DNA sequencing | "This work was supported in part by JSPS KAKENHI, grant number: 25461989 (TF), 25257508 (SY), 26293222 (SY), 26293142 (NM)." |
| 20 | Mollen[34], 2022 | 0.04-18 | targeted amplification based next generation sequencing | No competing financial interests exist. Funding was provided from the UPMC Children’s Hospital of Pittsburgh Scientific Program Fund. |
| 21 | Mostufi-Moab[19], 2018 | NR | multiplex PCR for gene mutations | National Cancer Institute (K07 CA166177; S.M.M.) |
| 22 | Newfield[35], 2022 | 0.5 | real-time PCR using allele specific primers and probes | This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. WJ, EL, RON, and RSN have nothing to disclose. DXS is an employee of Quest Diagnostics, and FMH is a former employee of Quest Diagnostics, and other than some equity interest in the company, they do not have other conflicts of interest. |
| 23 | Nies[36], 2021 | 0.8-66.1 | DNA sequencing | Marloes Nies received funding from the Junior Scientific Master Class Groningen, the Prince Bernhard |

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| | | | | Culture Fund, and the Academy Ter Meulen Grant of the Royal Netherlands Academy of Arts and Sciences for her research at The University of Texas MD Anderson Cancer Center. This work was supported in part by the National Institutes of Health/National Cancer Institute Cancer Center Support Grant (award No. P30CA016672) and used the Biostatistics Resource Group. |
| 24 | Oishi[37], 2017 | NR | allele-specific- PCR and/or Sanger sequencing | This study was funded by Japan Society for the Promotion of Science (JSPS) KAKENHI (Grant Number 25293087 and 90,623,661). The authors declare that they have no conflict of interest. |
| 25 | Onder[38], 2016 | 1.08-20.8 | allele specific real-time PCR- based direct sequencing | All authors declare that they have no conflict of interest. Funding: NR |
| 26 | Passon[39], 2015 | NR | PCR- based direct sequencing | Associazione Italiana per la Ricerca sul Cancro (AIRC) (Project No IG 10296), to DR (MIUR: Grant 2010NFEB9L_003), and to MC (MIUR: Grant RBFR12FI27_003). The authors declare that they have no conflict of interest. |
| 27 | Pekova[40], 2019 | 0.08-14 | next generation sequencing | This work was supported by the Ministry of Health of the Czech Republic. AZV (16-32665A) grants. The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported. |
| 28 | Pessôa-Pereira[41], 2019 | NR | direct DNA sequencing | Grants of FAPESB (Fundação de Amparo à Pesquisa no Estado da Bahia, APP0040/2011). No potential conflict of interest relevant to this article was reported. |
| 29 | Poyrazoglu[42], 2017 | 1-14.1 | pyrosequencing | Conflict of interest: None declared. The authors declared that this study received no financial support. |
| 30 | Prasad ML[14], 2016 | 0.25-6.9 | single-strand conformational polymorphism, next-generation sequencing | This study was supported by the authors' intradepartmental funding. Manju L. Prasad and Yuri E. Nikiforov received an honorarium from Loxo Oncology, the maker of tyrosine receptor kinase inhibitor, for their participation in an advisory meeting. Yuri E. Nikiforov reports consulting fees from Quest Diagnostics outside the submitted work. |
| 31 | Rogounovitch[43], 2021 | NR | direct DNA sequencing | Belarusian Republican Foundation for Fundamental Research (BRFFR), grant NoE08MC-007, the Institute of Physiology, National Academy of Sciences of Belarus (Minsk, Belarus), the Japan Society for the Promotion of Science (JSPS), KAKENHI Grant Number 19KK02670001, and intramurally by the Atomic Bomb Disease Institute, Nagasaki University |
| 32 | Romitti[44], 2012 | NR | RT-PCR, direct sequencing | This work was supported by Co-ordenac, a~o de Aperfei- c oamento de Pessoal de N ível Superior (CAPES), Conselho Nacional de Desenvolvimento Cient ífico e Tecnoló gico (CNPq), Fundac ão de Apoio a Pesquisa do Rio Grande do Sul (FAPERGS), and Fundo de Incentivo a Pesquisa do Hospital de Cl ínicas de Porto Alegre (FIPE), Brazil. The authors declare that |

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| | | | | there is no conflict of interest that could be perceived as prejudicing the impartiality of the re- search reported. |
| 33 | Şenyürek[45], 2022 | 0.16-1.8 | pyrosequencing | The authors declared that this study received no financial support |
| 34 | Sisdeli L[46], 2019 | NR | allele specific real-time PCR- based direct sequencing | FAPESP, grant number 2014/06570-6 . J.M.C. is a recipient of a scholarship of Research Productivity from CNPq - G.A.C.-G. is beneficiary of a scholarship from Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). L.S. and L.M. are beneficiaries of a scholarship from FAPESP. The authors declare that there is not coflict of interest. |
| 35 | Stenman[47], 2021 | NR | whole genome sequencing | Grant support from the Swedish Cancer Society, the Swedish Society for Medical Research and Karolinska Institutet. The authors declare that there is no conflict of interest |
| 36 | Vasko V[48], 2005 | NR | PCR direct sequencing | This study was supported by a research grant from the Flight At- tendant Medical Research Institute and a Johns Hopkins Clinician Sci- entist Award (to M.X.) |
| 37 | Zou M[49], 2014 | 12 | Sanger sequencing | The study is supported by a Biotechnology grant #10- BIO957-20 from King Abdulaziz City for Science and Technology. |

NR: not reported