



Raya Saab

Lindhard Family Professor of Pediatric Cancer Biology
Pediatrics - Hematology & Oncology

CLINICAL OFFICE (PRIMARY)

- **Pediatric Hematology and Oncology**

750 Welch Rd Ste 200

MC 5798

Palo Alto, CA 94304

Tel (650) 723-5535 Fax (650) 498-6937

Bio

BIO

I am a pediatric oncologist, and I primarily treat children who are diagnosed with soft tissue sarcomas including rhabdomyosarcoma, and children diagnosed with the eye tumor retinoblastoma, as well as children with other solid tumors.

I have two very different areas of primary research interest, both of which I pursue with passion. One focuses on global oncology, including clinical and research resource capacity building towards effective treatment and improving outcomes of children with cancer worldwide. I work with collaborators across the globe towards a common goal of improving access to diagnostic and clinical care, training of multidisciplinary teams, and building clinical resources and research capacity to develop context-informed approaches to improving cancer care and achieving better outcomes for children diagnosed with cancer irrespective of where they happen to live.

My parallel research interest, which is the focus of my laboratory, is understanding oncogenic signaling in pediatric soft tissue sarcomas, in an effort to clarify the driving biology and determinants of metastatic disease, to uncover novel targets for more effective treatment. We use preclinical in vitro and in vivo models, including murine and human cell lines, and mouse models of cancer. We have recently uncovered a paracrine role for rhabdomyosarcoma-secreted exosomes in impacting biology of stromal cells. Rhabdomyosarcoma-derived exosomes carry specific miRNA cargo that imparts an invasive and migratory phenotype on normal recipient fibroblasts, and proteomic analysis revealed specific and unique pathways relevant to the two different molecular rhabdomyosarcoma subtypes that are driven by distinct oncogenic pathways. We identified that the driver oncogene in fusion-positive rhabdomyosarcoma, PAX3-FOXO1, modulates exosome cargo to promote invasion, migration, and angiogenic properties, and identified specific microRNA and protein cargo acting as effectors of PAX3-FOXO1 exosome-mediated signaling, including modulation of oxidative stress response and cell survival signaling. Our ongoing work is focused on interrogating specific paracrine signaling pathways and molecular mechanisms of metastatic disease progression in rhabdomyosarcoma, for potential therapeutic targeting.

CLINICAL FOCUS

- Rhabdomyosarcoma
- Global Health
- Sarcoma

- Retinoblastoma
- Cancer Predisposition
- Pediatric solid tumors
- Pediatric Hematology-Oncology

ACADEMIC APPOINTMENTS

- Professor - University Medical Line, Pediatrics - Hematology & Oncology
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Cancer Institute

ADMINISTRATIVE APPOINTMENTS

- Director,, Bass Center Tissue Biorepository, (2023- present)
- Section Chief, Oncology, Lucile Packard Children's Hospital, Stanford University, CA, USA, (2022- present)
- Acting Director, Children's Cancer Institute, American University of Beirut Medical Center, (2017-2021)
- Associate Director for Administrative and Academic Affairs, Children's Cancer Institute, American University of Beirut Medical Center, (2014-2016)
- Director, Pediatric Cancer Research Program and Data Management Unit, Children's Cancer Institute, American University of Beirut Medical Center, (2012-2021)

HONORS AND AWARDS

- Global Health Faculty Fellow, Stanford Center for Innovation in Global Health (CIGH) (2026-present)
- Alpha Omega Alpha Honor Medical Society, American University of Beirut (1999)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, PARC committee (Program for Advancing the Research Capacity for Pediatric Cancer Clinical Trials in Low Income Countries and Middle-Income Countries), International Society of Pediatric Oncology (SIOP) (2022 - present)
- Chair, SIOP-North America Scientific Committee (2022 - present)
- Associate Editor, JCO Global Oncology (2023 - present)

PROFESSIONAL EDUCATION

- Internship: American University of Beirut School of Medicine (2000) Lebanon
- Medical Education: American University of Beirut School of Medicine (1999) Lebanon
- Residency: Duke University School of Medicine (2003) NC
- Board Certification: Pediatric Hematology-Oncology, American Board of Pediatrics (2017)
- Fellowship: St Jude Children's Research Hospital (2007) TN
- Fellowship: University of Tennessee Pediatric Hematology and Oncology Fellowship (2006) TN
- Board Certification: Pediatrics, American Board of Pediatrics (2003)

COMMUNITY AND INTERNATIONAL WORK

- Clinical and Research Capacity Building in Global Pediatric Oncology, Middle East, North Africa, Asia

Research & Scholarship

CLINICAL TRIALS

- Genome, Proteome and Tissue Microarray in Childhood Acute Leukemia, Recruiting

- Phase I GD2 CAR T Cells for H3K27M-mutant Diffuse Midline Glioma (DMG), Recruiting
- Phase III Active Surveillance in Low Risk +Carboplatin vs Cisplatin in Standard Risk GermCell Tumors, Recruiting
- Phase III Trial Comparing Open vs Thoracoscopic Management of Pulmonary Metastases in Osteosarcoma, Recruiting
- A Study of Therapeutic lobenguane (131-I) and Vorinostat for Recurrent or Progressive High-Risk Neuroblastoma Subjects, Not Recruiting
- Phase II Treatment of Newly Diagnosed Diffuse Anaplastic & Relapsed Favorable Histology Wilms Tumors, Not Recruiting
- Phase II/III Pediatric Hepatic Malignancy International Therapeutic Trial (PHITT), Not Recruiting
- Phase III VINO-AC +ChemoTx +VINO-CPO vs VAC +VINO-CPO in High Risk Rhabdomyosarcoma (HR-RMS), Not Recruiting
- Phase IV NonInterventional in LocallyAdvanced /Metastatic TRK FusionCancer Treated w/ Larotrectinib, Not Recruiting
- Renal Tumors Classification, Biology, and Banking Study, Not Recruiting

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Faiz Ahmad, Yu-Lieh Lin

Publications

PUBLICATIONS

- **Germline genetic testing trends in pediatric cancer patients: A SEER registry analysis**
Johns, C., Huang, M., Hodan, R., McGuinness, M., Kurian, A. W., Saab, R.
AMER ASSOC CANCER RESEARCH.2026
- **Targeting ceramide metabolism to restore hypoxia-induced apoptosis in p53-deficient colon cancer cells.** *PLoS one*
Mechleb, K., Hourani, N., Fakhry, M., Alyamani, O. A., Hage-Sleiman, R., Younes, H., Fayad, A. A., Soudani, N., Sakr, A., Darwiche, N., Nemer, G., Saab, R., Mrad, et al
2026; 21 (1): e0340295
- **Sequential CD19 and CD22 CART for relapsed and refractory B cell ALL: Phase I results**
Schultz, L., Aftandilian, C., Baggott, C., Corwin, N., Fujimoto, M., Li, A., Mavroukakis, S., Moon, J., Sahaf, B., Jacobs, A., Mendoza, C., Levenson, A., Frank, et al
ELSEVIER.2025: 2374
- **Adaptive Clinical Neuroblastoma Risk Groups-Tailoring Treatment in Low- and Middle-Income Countries: An International Neuroblastoma Risk Group Project.** *JCO global oncology*
London, W. B., Villanueva, G., Shyr, D., van Heerden, J., Fuentes-Alabi, S., Saab, R., Harrison, D., Pappan, R., Kim Nguyen, H. T., Noun, D., Kambugu, J., Rascon, J., Garami, et al
2025; 11: e2500349
- **Pre-transplant CAR T-cell therapy is associated with inferior survival and increased non-relapse mortality in pediatric B-ALL: A single-center retrospective analysis**
Chok, R., Huang, M., Aftandilian, C., Schultz, L., Shyr, D., Lacayo, N., Shah, A., Saab, R., Gruber, T., Mackall, C., Bertaina, A., Davis, K., Klein, et al
ELSEVIER.2025: 6077-6078
- **Liposarcoma and Leiomyosarcoma as the First Manifestation of Familial Retinoblastoma: Implications for Genetic Testing and Carrier Surveillance.** *JCO precision oncology*
Johns, C., McGuinness, M., Kingham, K., Suarez, C. J., Mruthyunjaya, P., Ford, J. M., Saab, R.
2025; 9: e2500668
- **Prioritization of novel agents for further investigation in pediatric non-rhabdomyosarcoma soft tissue sarcomas: A report from the Children's Oncology Group.** *European journal of cancer (Oxford, England : 1990)*
Crane, J. N., Douglass, D. P., Oberoi, S., Collins, N. B., Gupta, A., Metts, J. L., Avutu, V., Dela Cruz, F. S., Davis, J. L., Federman, N. C., Hiniker, S. M., Laetsch, T. W., Linardic, et al

2025; 226: 115600

- **Whole genome-based circulating tumor DNA analysis as an ultrasensitive biomarker in pediatric sarcomas.** Johns, C., Subramanian, A., Soudi, S., Somani, A., Oladipo, E., Ryu, F., Kaneko, T., New, C., Kenney, D., Nouth, S., Avedian, R., Steffner, R., Mohler, et al
LIPPINCOTT WILLIAMS & WILKINS.2025: 10053
- **Advancing Equity in Global Pediatric Oncology Authorship: A Key to Research Progress and Capacity Building.** *JCO global oncology*
Saab, R.
2025; 11: e2500055
- **Congenital peribronchial myofibroblastic tumors harbor a recurrent EGFR kinase domain duplication.** *Modern pathology : an official journal of the United States and Canadian Academy of Pathology, Inc*
Younes, S., Suarez, C. J., Pogoriler, J., Bhatti, T., Shenoy, A., Saab, R., Surrey, L. F., Tan, S. Y.
2024: 100661
- **Retinoblastoma programme outcome over a 10-year period in Lebanon: assessment of potential impact of the pandemic and economic crisis.** *Eye (London, England)*
Al-Haddad, C., Wehbi, Z., Slim, A., Hmede, A., Jurdi Kheir, W., Saab, R., Nawfal, C., Bechara, E.
2024
- **Aggressive Pediatric Primitive Round Cell Tumors with MN1::ZNF341 Fusion: A Mimic of Neuroblastoma.** *Pediatric blood & cancer*
Tan, S. Y., Evans, M. G., Saab, R., Gupta, A., Reid, J., Dao, T., Rubin, E., Crymes, A., Semenova, K., Shimada, H., Livasy, C., Nael, A.
2024: e31425
- **Single-Cell Fluidic Force Spectroscopy Reveals Dynamic Mechanical Fingerprints of Malignancy in Breast Cancer.** *ACS applied materials & interfaces*
Habli, Z., Zantout, A., Al-Haj, N., Saab, R., El-Sabban, M., Khraiche, M. L.
2024
- **Converting cell death into senescence by PARP1 inhibition improves recovery from acute oxidative injury.** *Nature aging*
Nehme, J., Mesilmany, L., Varela-Eirin, M., Brandenburg, S., Altulea, A., Lin, Y., Gaya da Costa, M., Seelen, M., Hillebrands, J. L., van Goor, H., Saab, R., Akl, H., Prevarskaya, et al
2024
- **Exosome-Mediated Paracrine Signaling Unveils miR-1246 as a Driver of Aggressiveness in Fusion-Negative Rhabdomyosarcoma.** *Cancers*
Ramadan, F., Saab, R., Ghamloush, F., Khoueiry, R., Herceg, Z., Gomez, L., Badran, B., Clezardin, P., Hussein, N., Cohen, P. A., Ghayad, S. E.
2024; 16 (9)
- **Molecular-guided therapy for the treatment of patients with relapsed and refractory childhood cancers: a Beat Childhood Cancer Research Consortium trial.** *Genome medicine*
Sholler, G. L., Bergendahl, G., Lewis, E. C., Kraveka, J., Ferguson, W., Nagulapally, A. B., Dykema, K., Brown, V. I., Isakoff, M. S., Junewick, J., Mitchell, D., Rawwas, J., Roberts, et al
2024; 16 (1): 28
- **A regional virtual case discussion forum in pediatric oncology: Experience of the Pediatric Oncology East and Mediterranean Group.** *Pediatric blood & cancer*
Noun, D., Obeid, A., Belgaumi, A., Sidhom, I., Jadiry, M. A., Al-Saeed, R., Khalifa, N., Trehan, A., Ghanem, K., AbdelHafeez, H., Rodriguez-Galindo, C., Jeha, S., Saab, et al
2023: e30838
- **Prospective External Validation of the Esbenshade Vanderbilt Models Accurately Predicts Bloodstream Infection Risk in Febrile Non-Neutropenic Children With Cancer.** *Journal of clinical oncology : official journal of the American Society of Clinical Oncology*
Zhao, Z., Patel, P. A., Slatnick, L., Sitthi-Amorn, A., Bielałowicz, K. J., Nunez, F. A., Walsh, A. M., Hess, J., Rossoff, J., Elgarten, C., Myers, R., Saab, R., Basbous, et al
2023: JCO2301814
- **Development of EPAT: An assessment tool for pediatric hematology/oncology training programs.** *Cancer*
Moreira, D. C., Metzger, M. L., Antillon-Klussmann, F., Gonzalez-Ramella, O., Gao, Y., Bazzeh, F., Middlekauff, J., Fox Irwin, L., Gonzalez, M. L., Chantada, G., Barr, R. D., Garrington, T., Hastings, et al
2023

- **Using comprehensive genomic and functional analyses for resolving genotype-phenotype mismatches in children with suspected CMMRD in Lebanon: an IRRDC study.** *Human genetics*
Hamideh, D., Das, A., Bianchi, V., Chung, J., Negm, L., Levine, A., Basbous, M., Sanchez-Ramirez, S., Mikael, L., Jabado, N., Atweh, L., Lteif, M., Mahfouz, et al
2023
- **Addressing the Gap in Research Methodologies Education in Pediatric Oncology in the Eastern Mediterranean Region.** *JCO global oncology*
Saab, R., Santana, V., Obeid, A., Devidas, M., Belgaumi, A., Bhakta, N., Naidu, P., Saha, V., Sultan, I., Arora, R. S., Mukoka, L., Jeha, S.
2023; 9: e2200295
- **A temporal in vivo catalogue of chromatin accessibility and expression profiles in pineoblastoma reveals a prevalent role for repressor elements.** *Genome research*
Idriss, S., Hallal, M., El-Kurdi, A., Zalzali, H., El-Rassi, I., Ehli, E. A., Davis, C. M., Chung, P. E., Gendoo, D. M., Zacksenhaus, E., Saab, R., Khoueiry, P.
2023
- **Heritable cancer predisposition testing in pediatric cancer patients excluding retinoblastoma in a middle-income country** *PEDIATRIC BLOOD & CANCER*
El Khatib, O., Yahya, Y., Mahfouz, R., Hamadeh, L., Basbous, M., Abboud, M. R., Muwakkit, S., Rodriguez-Galindo, C., Jeha, S., Saab, R.
2022: e29982
- **Non-coding RNA in rhabdomyosarcoma progression and metastasis.** *Frontiers in oncology*
Ramadan, F., Saab, R., Hussein, N., Clézardin, P., Cohen, P. A., Ghayad, S. E.
2022; 12: 971174
- **The Global Retinoblastoma Outcome Study: a prospective, cluster-based analysis of 4064 patients from 149 countries** *LANCET GLOBAL HEALTH*
Alia, D. B., Tandili, A., Paiva, L., Wime, A., Chantada, G. L., Fandino, A. C., Sgroi, M., Pappan, R., Tamamyran, G., Camuglia, J. E., Gole, G. A., Clark, A., Lam, et al
2022; 10 (8): E1128-E1140
- **CD147 Promotes Tumorigenesis via Exosome-Mediated Signaling in Rhabdomyosarcoma.** *Cells*
Fahs, A., Hussein, N., Zalzali, H., Ramadan, F., Ghamloush, F., Tamim, H., El Homsy, M., Badran, B., Boulos, F., Tawil, A., Ghayad, S. E., Saab, R.
2022; 11 (15)
- **Pediatric oncology infrastructure and workforce training needs: a report from the Pediatric Oncology East and Mediterranean (POEM) Group.** *Pediatric blood & cancer*
Khan, M. S., Al-Jadiry, M. F., Tarek, N., Zamzam, M., Saab, R., Trehan, A., Rihani, R., AlRawas, A., Jeha, S., Belgaumi, A. F.
2022: e29858
- **PATTERNS OF CEREBROSPINAL FLUID DIVERSION AND SURVIVAL IN CHILDREN WITH DIFFUSE INTRINSIC PONTINE GLIOMA: A REPORT FROM THE INTERNATIONAL DIFFUSE INTRINSIC PONTINE GLIOMA REGISTRY**
Cooney, T., DeWire-Schottmiller, M., Lane, A., Saab, R., Bandopadhyay, P., Dorris, K., Packer, R., Kilburn, L., Minturn, J., Dodgshun, A., Parkin, S., Goldman, S., Sandler, et al
OXFORD UNIV PRESS INC.2022: 23-24
- **Estimated incidence, prevalence, mortality, and registration of childhood cancer (ages 0-14 years) in the WHO Eastern Mediterranean region: an analysis of GLOBOCAN 2020 data.** *The Lancet. Child & adolescent health*
Fadhil, I., Soliman, R., Jaffar, S., Al Madhi, S., Saab, R., Belgaumi, A., Elhaddad, A.
2022; 6 (7): 466-473
- **Long-term follow-up of children treated with the Repiphysis expandable prosthesis for lower extremity bone sarcoma.** *Journal of pediatric orthopedics. Part B*
Masrouha, K., Abboud, M., Saab, R., Muwakkit, S. A., Khoury, N., Haidar, R., Saghie, S.
2022; 31 (2): e258-e263
- **Vincristine-induced neurotoxicity in pediatric patients with rhabdomyosarcoma: A retrospective analysis of clinical features and outcome** *PEDIATRIC HEMATOLOGY AND ONCOLOGY*
Dakik, L., Basbous, M., Tamim, H., Moubarak, Y., Tarek, N., Hamideh, D., Muwakkit, S., Abboud, M., Saab, R.
2022: 1-6

- **Global Neuroblastoma Network: An international multidisciplinary neuroblastoma tumor board for resource-limited countries** *PEDIATRIC BLOOD & CANCER*
Matthay, K. K., Hylton, J., Penumathy, N., Khattab, M., Soh, S., Nguyen, H., Alcasabas, A., Fawzy, M., Saab, R., Khan, M., Ghandour, K., Chantada, G., Parikh, et al
2022; 69 (4): e29568
- **Burden of cancer in adolescents and young adults.** *The Lancet. Oncology*
Saab, R.
2021; 23 (1): 2-3
- **Cancer care for displaced children in Lebanon.** *The Lancet. Oncology*
Saab, R., Ghanem, K., Jeha, S.
2021; 22 (12): 1663-1664
- **A GRIN3A polymorphism may be associated with glucocorticoid-induced symptomatic osteonecrosis in children with acute lymphoblastic leukemia** *PERSONALIZED MEDICINE*
Zgheib, N. K., El-Khoury, H., Maamari, D., Basbous, M., Saab, R., Muwakkit, S. A.
2021; 18 (05): 431-439
- **Treatment-induced cerebral sinus venous thrombosis in childhood acute lymphoblastic malignancies: New risk factors to consider** *PEDIATRIC BLOOD & CANCER*
El-Khoury, H., Saifi, O., Haddad, S., Chahrour, M., Ghanem, K. M., Mubarak, Y., Tamim, H., Makki, M., Zakka, C., Chan, A. K., Mahfouz, R., Tarek, N., El-Solh, et al
2021; 68 (11): e29210
- **Cancer Registration in the Middle East, North Africa, and Turkey: Scope and Challenges** *JCO GLOBAL ONCOLOGY*
Abdul-Sater, Z., Shamseddine, A., Taher, A., Fouad, F., Abu-Sitta, G., Fadhil, I., Saab, R., Sullivan, R., Adib, S. M., Saleh, S., Mukherji, D., ICRIM
2021; 7: 1101-1109
- **Pediatric oncology infrastructure and workforce training needs: A report from the Pediatric Oncology East and Mediterranean (POEM) Group** *PEDIATRIC BLOOD & CANCER*
Khan, M., Al-Jadiry, M., Tarek, N., Zamzam, M., Saab, R., Trehan, A., Rihani, R., AlRawas, A., Jeha, S., Belgaumi, A. F.
2021; 68 (9): e29190
- **Extraskeletal Ewing sarcoma: Diagnosis, management and prognosis** *ONCOLOGY LETTERS*
Abboud, A., Masrouha, K., Saliba, M., Haidar, R., Saab, R., Khoury, N., Tawil, A., Saghieh, S.
2021; 21 (5): 354
- **Childhood cancer care in the Middle East, North Africa, and West/Central Asia: A snapshot across five countries from the POEM network** *CANCER EPIDEMIOLOGY*
Basbous, M., Al-Jadiry, M., Belgaumi, A., Sultan, I., Al-Haddad, A., Jeha, S., Saab, R.
2021; 71: 101727
- **RE-IRRADIATION OF DIPG: DATA FROM THE INTERNATIONAL DIPG REGISTRY**
Lafay-Cousin, L., Lane, A., Schafer, A., Saab, R., Cheng, S., Bandopadhyay, P., Zaghoul, M., El-Ayadi, M., Dorris, K., Packer, R., Kilburn, L., Minturn, J., Dodgshun, et al
OXFORD UNIV PRESS INC.2020: 301-2
- **PATTERNS OF CEREBROSPINAL FLUID DIVERSION AND SURVIVAL IN CHILDREN WITH DIFFUSE INTRINSIC PONTINE GLIOMA: A REPORT FROM THE INTERNATIONAL DIPG REGISTRY**
Cooney, T., DeWire-Schottmiller, M., Lane, A., Saab, R., Bandopadhyay, P., Dorris, K., Packer, R., Kilburn, L., Minturn, J., Dodgshun, A., Parkin, S., Goldman, S., Sandler, et al
OXFORD UNIV PRESS INC.2020: 297-98
- **Effects of the Oncoprotein PAX3-FOXO1 on Modulation of Exosomes Function and Protein Content: Implications on Oxidative Stress Protection and Enhanced Plasticity** *FRONTIERS IN ONCOLOGY*
Fahs, A., Ramadan, F., Ghamloush, F., Ayoub, A. J., Ahmad, F., Kobeissy, F., Mechref, Y., Zhao, J., Zhu, R., Hussein, N., Saab, R., Ghayad, S. E.
2020; 10: 1784
- **Isolated Central Nervous System Relapse Following Treatment Reduction in Low-risk Acute Lymphoblastic Leukemia at the Children's Cancer Center of Lebanon** *JOURNAL OF PEDIATRIC HEMATOLOGY ONCOLOGY*

- El-Khoury, H., Chahrour, M., Ghanem, K. M., Saifi, O., Tamim, H., El-Solh, H., Hamideh, D., Tarek, N., Saab, R., Abboud, M. R., Muwakkit, S. A. 2020; 42 (6): E428-E433
- **Impact of the coronavirus disease 2019 (COVID-19) pandemic on pediatric oncology care in the Middle East, North Africa, and West Asia Region: A report from the Pediatric Oncology East and Mediterranean (POEM) Group** *CANCER*
Saab, R., Obeid, A., Gachi, F., Boudiaf, H., Sargsyan, L., Al-Saad, K., Javakhadze, T., Mehrvar, A., Abbas, S., Al-Agele, Y., Al-Haddad, S., Al Ani, M., Al-Sweedan, et al
2020; 126 (18): 4235-4245
 - **Circulating Tumor Cell Detection Technologies and Clinical Utility: Challenges and Opportunities** *CANCERS*
Habli, Z., AlChamaa, W., Saab, R., Kadara, H., Khraiche, M. L.
2020; 12 (7)
 - **Global Retinoblastoma Presentation and Analysis by National Income Level** *JAMA ONCOLOGY*
Fabian, I., Abdallah, E., Abdullahi, S. U., Abdulqader, R. A., Boubacar, S., Ademola-Popoola, D. S., Adio, A., Afshar, A. R., Aggarwal, P., Aghaji, A. E., Ahmad, A., Akib, M. N. R., Al Harby, et al
2020; 6 (5): 685–95
 - **The value of diffusion weighted imaging and apparent diffusion coefficient in primary Osteogenic and Ewing sarcomas for the monitoring of response to treatment: Initial experience** *EUROPEAN JOURNAL OF RADIOLOGY*
Asmar, K., Saade, C., Salman, R., Saab, R., Khoury, N. J., Abboud, M., Tamim, H., Makki, M., Naffaa, L.
2020; 124: 108855
 - **Global Retinoblastoma Presentation and Analysis by National Income Level.** *JAMA oncology*
Global Retinoblastoma Study Group, Fabian, I. D., Abdallah, E., Abdullahi, S. U., Abdulqader, R. A., Adamou Boubacar, S., Ademola-Popoola, D. S., Adio, A., Afshar, A. R., Aggarwal, P., Aghaji, A. E., Ahmad, A., Akib, M. N., et al
2020
 - **Signaling pathways in Rhabdomyosarcoma invasion and metastasis** *CANCER AND METASTASIS REVIEWS*
Ramadan, F., Fahs, A., Ghayad, S. E., Saab, R.
2020; 39 (1): 287-301
 - **The PAX3-FOXO1 oncogene alters exosome miRNA content and leads to paracrine effects mediated by exosomal miR-486** *SCIENTIFIC REPORTS*
Ghamloush, F., Ghayad, S. E., Rammal, G., Fahs, A., Ayoub, A. J., Merabi, Z., Harajly, M., Zalzali, H., Saab, R.
2019; 9: 14242
 - **Proteomic Profiling of Rhabdomyosarcoma-Derived Exosomes Yield Insights into Their Functional Role in Paracrine Signaling** *JOURNAL OF PROTEOME RESEARCH*
Rammal, G., Fahs, A., Kobeissy, F., Mechref, Y., Zhao, J., Zhu, R., Diab-Assaf, M., Saab, R., Ghayad, S. E.
2019; 18 (10): 3567-3579
 - **Establishment of a formal program for retinoblastoma: Feasibility of clinical coordination across borders and impact on outcome** *PEDIATRIC BLOOD & CANCER*
Al-Haddad, C., Bashour, Z., Farah, L., Bayram, L., Merabe, Z., Ma'luf, R., Alameddine, R., Eid, T., Geara, F., Wilson, M., Brennan, R., Jeha, S., Ghanem, et al
2019; 66 (11): e27959
 - **Illness cognition and health anxiety in parents of children with cancer** *JOURNAL OF PSYCHOSOCIAL ONCOLOGY*
Bilani, N., Jamali, S., Chahine, A., Zorkot, M., Homsy, M., Saab, M., Saab, R., Nabulsi, M., Chaaya, M.
2019; 37 (6): 713-728
 - **Identifying barriers to treatment of childhood rhabdomyosarcoma in resource-limited settings: A literature review** *PEDIATRIC BLOOD & CANCER*
Papyan, R., Tamamyian, G., Danielyan, S., Tananyan, A., Muradyan, A., Saab, R.
2019; 66 (7): e27708
 - **Clinical Prognostic Factors and Outcome in Pediatric Osteosarcoma: Effect of Delay in Local Control and Degree of Necrosis in a Multidisciplinary Setting in Lebanon** *JOURNAL OF GLOBAL ONCOLOGY*
Abou Ali, B., Salman, M., Ghanem, K. M., Boulos, F., Haidar, R., Saghie, S., Akel, S., Muwakkit, S. A., Ei-Solh, H., Saab, R., Tamim, H., Abboud, M. R.

2019; 5: 1-8

- **Spirituality among parents of children with cancer in a Middle Eastern country** *EUROPEAN JOURNAL OF ONCOLOGY NURSING*
Doumit, M. A. A., Rahi, A. C., Saab, R., Majdalani, M.
2019; 39: 21-27
- **The histone deacetylase inhibitor Suberoylanilide Hydroxamic Acid (SAHA) as a therapeutic agent in rhabdomyosarcoma** *CANCER BIOLOGY & THERAPY*
Ghayad, S. E., Rammal, G., Sarkis, O., Basma, H., Ghamloush, F., Fahs, A., Karam, M., Harajli, M., Rabeh, W., Mouawad, J. E., Zalzal, H., Saab, R.
2019; 20 (3): 272-283
- **Infantile myofibromatosis: review of imaging findings and emphasis on correlation between MRI and histopathological findings** *CLINICAL IMAGING*
Naffaa, L., Khalifeh, I., Salman, R., Itani, M., Saab, R., Al-kutoubi, A.
2019; 54: 40-47
- **Genetic polymorphisms in candidate genes are not associated with increased vincristine-related peripheral neuropathy in Arab children treated for acute childhood leukemia: a single institution study** *PHARMACOGENETICS AND GENOMICS*
Zgheib, N. K., Ghanem, K. M., Tamim, H., Aridi, C., Shahine, R., Tarek, N., Saab, R., Abboud, M. R., El-Solh, H., Muwakkit, S. A.
2018; 28 (8): 189-195
- **Genomics of adult and pediatric solid tumors.** *American journal of cancer research*
Rahal, Z., Abdulhai, F., Kadara, H., Saab, R.
2018; 8 (8): 1356-1386
- **CHARACTERISTICS OF PATIENTS >= 10 YEARS OF AGE WITH DIFFUSE INTRINSIC PONTINE GLIOMA: A REPORT FROM THE INTERNATIONAL DIPG REGISTRY**
Erker, C., Lane, A., Chaney, B., Escorza, N., Fuller, C., Saab, R., Kieran, M., Packer, R., Nazarian, J., Minturn, J., Dodgshun, A., Parkin, S., Foreman, et al
OXFORD UNIV PRESS INC.2018: 63
- **CD4-positive lymphoepithelial-like carcinoma: Report of unusual case.** *Avicenna journal of medicine*
Aziz, L., Saab, R., Eid, T., Al-Abadi, M. A.
2018; 8 (2): 58-62
- **Displaced Children With Cancer in Lebanon: A Sustained Response to an Unprecedented Crisis** *CANCER*
Saab, R., Jeha, S., Khalifeh, H., Zahreddine, L., Bayram, L., Merabi, Z., Abboud, M., Muwakkit, S., Tarek, N., Rodriguez-Galindo, C., El Solh, H.
2018; 124 (7): 1464-1472
- **Interplay between p53 and Ink4c in spermatogenesis and fertility** *CELL CYCLE*
Zalzal, H., Rabeh, W., Najjar, O., Ammar, R., Harajly, M., Saab, R.
2018; 17 (5): 643-651
- **Routine surveillance imaging after end of therapy for pediatric extracranial tumors: A retrospective analysis** *PEDIATRIC BLOOD & CANCER*
Lakkis, F., Alaiwi, S., Naffaa, L., Atweh, L., Khoury, N., Abboud, M., Muwakkit, S., Tarek, N., El Solh, H., Saab, R.
2018; 65 (1)
- **Pediatric cancer pathology review from a single institution: Neuropathology expert opinion is essential for accurate diagnosis of pediatric brain tumors** *PEDIATRIC BLOOD & CANCER*
Merabi, Z., Boulos, F., Santiago, T., Jenkins, J., Abboud, M., Muwakkit, S., Tarek, N., Zaatari, G., Jeha, S., El-Solh, H., Saab, R.
2018; 65 (1)
- **Cerebral sinus venous thrombosis during childhood acute lymphoblastic leukemia therapy: Risk factors and management** *PEDIATRIC BLOOD & CANCER*
Ghanem, K., Dhayni, R. M., Al-Aridi, C., Tarek, N., Tamim, H., Chan, A. K. C., Saab, R., Abboud, M. R., El-Solh, H., Muwakkit, S. A.
2017; 64 (12)
- **Fludarabine-based reduced intensity regimen for matched related donor hematopoietic stem cell transplantation in acquired severe aplastic anemia** *CURRENT RESEARCH IN TRANSLATIONAL MEDICINE*
Ghanem, K. M., Kharfan-Dabaja, M. A., El-Solh, H., Harris, N., Kreidieh, N., Nehme, R., Muwakkit, S. A., Saab, R., Bazarbachi, A., Abboud, M. R.

2017; 65 (3): 115-119

- **Predictors of benzodiazepine use among parents of children with cancer: a cross-sectional study from Lebanon** *PSYCHO-ONCOLOGY*
Fayad, D., Genadry, K., Hanna, K., Itani, A., Kibbi, N., Rustam, L., Saab, R., Nabulsi, M.
2017; 26 (8): 1225-1228
- **Multisite external validation of a risk prediction model for the diagnosis of blood stream infections in febrile pediatric oncology patients without severe neutropenia.** *Cancer*
Esbenshade, A. J., Zhao, Z., Aftandilian, C., Saab, R., Wattier, R. L., Beauchemin, M., Miller, T. P., Wilkes, J. J., Kelly, M. J., Fernbach, A., Jeng, M., Schwartz, C. L., Dvorak, et al
2017
- **Collaborative Pediatric Bone Tumor Program to Improve Access to Specialized Care: An Initiative by the Lebanese Children's Oncology Group** *JOURNAL OF GLOBAL ONCOLOGY*
Saab, R., Merabi, Z., Abboud, M. R., Muwakkit, S., Noun, P., Gemayel, G., Bechara, E., Khalifeh, H., Farah, R., Kabbara, N., El-Khoury, T., Al-Yousef, R., Haidar, et al
2017; 3 (1): 23-30
- **NUDT15 and TPMT genetic polymorphisms are related to 6-mercaptopurine intolerance in children treated for acute lymphoblastic leukemia at the Children's Cancer Center of Lebanon** *PEDIATRIC BLOOD & CANCER*
Zgheib, N. K., Akika, R., Mahfouz, R., Aridi, C., Ghanem, K. M., Saab, R., Abboud, M. R., Tarek, N., El Solh, H., Muwakkit, S. A.
2017; 64 (1): 146-150
- **Mandibular melanotic neuroectodermal tumor of infancy: a role for neoadjuvant chemotherapy** *EUROPEAN ARCHIVES OF OTO-RHINO-LARYNGOLOGY*
Maroun, C., Khalifeh, I., Alam, E., Akl, P., Saab, R., Moukarbel, R. V.
2016; 273 (12): 4629-4635
- **Exosomes derived from embryonal and alveolar rhabdomyosarcoma carry differential miRNA cargo and promote invasion of recipient fibroblasts** *SCIENTIFIC REPORTS*
Ghayad, S. E., Rammal, G., Ghamloush, F., Basma, H., Nasr, R., Diab-Assaf, M., Chelala, C., Saab, R.
2016; 6: 37088
- **The synthetic retinoid ST1926 as a novel therapeutic agent in rhabdomyosarcoma** *INTERNATIONAL JOURNAL OF CANCER*
Basma, H., Ghayad, S. E., Rammal, G., Mancinelli, A., Harajly, M., Ghamloush, F., Dweik, L., El-Eit, R., Zalzal, H., Rabeh, W., Pisano, C., Darwiche, N., Saab, et al
2016; 138 (6): 1528-1537
- **Wilms tumor: Successes and challenges in management outside of cooperative clinical trials.** *Hematology/oncology and stem cell therapy*
Rabeh, W., Akel, S., Eid, T., Muwakkit, S., Abboud, M., El Solh, H., Saab, R.
2016; 9 (1): 20-5
- **Effect of Malnutrition at Diagnosis on Clinical Outcomes of Children With Acute Lymphoblastic Leukemia** *JOURNAL OF PEDIATRIC HEMATOLOGY ONCOLOGY*
Yazbeck, N., Samia, L., Saab, R., Abboud, M. R., Solh, H., Muwakkit, S.
2016; 38 (2): 107-110
- **p53 Restoration in Induction and Maintenance of Senescence: Differential Effects in Premalignant and Malignant Tumor Cells** *MOLECULAR AND CELLULAR BIOLOGY*
Harajly, M., Zalzal, H., Nawaz, Z., Ghayad, S. E., Ghamloush, F., Basma, H., Zainedin, S., Rabeh, W., Jabbour, M., Tawil, A., Badro, D. A., Evan, G. I., Saab, et al
2016; 36 (3): 438-451
- **Approach to Non-Neutropenic Fever in Pediatric Oncology Patients-A Single Institution Study** *PEDIATRIC BLOOD & CANCER*
Abou Ali, B., Hirmas, N., Tamim, H., Merabi, Z., Hanna-Wakim, R., Muwakkit, S., Abboud, M., El Solh, H., Saab, R.
2015; 62 (12): 2167-2171
- **CDK2 Transcriptional Repression Is an Essential Effector in p53-Dependent Cellular Senescence-Implications for Therapeutic Intervention** *MOLECULAR CANCER RESEARCH*
Zalzal, H., Nasr, B., Harajly, M., Basma, H., Ghamloush, F., Ghayad, S., Ghanem, N., Evan, G. I., Saab, R.
2015; 13 (1): 29-40

- **Indocyanine Green-Enhanced Thermotherapy for Retinoblastoma.** *Ocular oncology and pathology*
Al-Haddad, C. E., Abdulaal, M., Saab, R. H., Bashshur, Z. F.
2014; 1 (2): 77-82
- **Cytomegalovirus retinitis in children and young adults with acute lymphoblastic leukemia in Lebanon** *LEUKEMIA & LYMPHOMA*
Samia, L., Hamam, R., Dbaibo, G., Saab, R., El-Solh, H., Abboud, M., Muwakkit, S.
2014; 55 (8): 1918-1921
- **Caregivers' Perception of Drug Administration Safety for Pediatric Oncology Patients** *JOURNAL OF PEDIATRIC ONCOLOGY NURSING*
Harris, N., Badr, L., Saab, R., Khalidi, A.
2014; 31 (2): 95-103
- **Outcome of Ewing sarcoma in a multidisciplinary setting in Lebanon.** *Pediatric blood & cancer*
Abou Ali, B., Nader, R., Tamim, H., Eid, T., Boulos, F., Khoury, N., Akel, S., Haidar, R., Saghieh, S., Abboud, M., Muwakkit, S., El-Solh, H., Saab, et al
2014; 61 (8): 1472-5
- **Premalignancy and Cellular Senescence** *TUMOR DORMANCY, QUIESCENCE, AND SENESCENCE, VOL 2: AGING, CANCER, AND NONCANCER PATHOLOGIES*
Abbas, H. A., Saab, R.
edited by Hayat, M. A.
2014: 195-206
- **A Case of Pitt-Hopkins Syndrome With Absence of Hyperventilation** *JOURNAL OF CHILD NEUROLOGY*
Inati, A., Abbas, H. A., Korjian, S., Daaboul, Y., Harajily, M., Saab, R.
2013; 28 (12): 1698-1701
- **Cyclophosphamide and Topotecan as First-line Salvage Therapy in Patients With Relapsed Ewing Sarcoma at a Single Institution** *JOURNAL OF PEDIATRIC HEMATOLOGY ONCOLOGY*
Farhat, R., Raad, R., Khoury, N. J., Feghaly, J., Eid, T., Muwakkit, S., Abboud, M., El-Solh, H., Saab, R.
2013; 35 (5): 356-360
- **Complete heart block in a patient with acute lymphoblastic leukaemia: teicoplanin as a possible cause and review of literature** *JOURNAL OF CLINICAL PHARMACY AND THERAPEUTICS*
Sharif-Yakan, A., Arabi, M., Musharrafieh, U. M., Bitar, F. F., Saab, R., Abboud, M. R., Muwakkit, S.
2013; 38 (2): 156-158
- **Calcaneal osteosarcoma: a rare cause of heel pain in the paediatric population.** *BMJ case reports*
Taslakian, B., Issa, G., Saab, R., Jabbour, M. N., Khoury, N. J.
2013; 2013
- **Congenital infantile fibrosarcoma: Association with bleeding diathesis** *AMERICAN JOURNAL OF CASE REPORTS*
Salman, M., Khoury, N. J., Khalifeh, I., Abbas, H. A., Majdalani, M., Abboud, M., Muwakkit, S., El Solh, H., Saab, R.
2013; 14: 481-485
- **Correlation of non-mass-like abnormal MR signal intensity with pathological findings surrounding pediatric osteosarcoma and Ewing's sarcoma** *SKELETAL RADIOLOGY*
Masrouha, K. Z., Musallam, K. M., Samra, A., Tawil, A., Haidar, R., Chakhachiro, Z., Saghieh, S., Abdallah, A., Saab, R., Muwakkit, S., Abboud, M. R., Khoury, N. J.
2012; 41 (11): 1453-1461
- **Implementation of an intensive risk-stratified treatment protocol for children and adolescents with acute lymphoblastic leukemia in Lebanon** *AMERICAN JOURNAL OF HEMATOLOGY*
Muwakkit, S., Al-Aridi, C., Samra, A., Saab, R., Mahfouz, R. A., Farra, C., Jeha, S., Abboud, M. R.
2012; 87 (7): 678-683
- **Retinoic acid fails to induce cell cycle arrest with myogenic differentiation in rhabdomyosarcoma** *PEDIATRIC BLOOD & CANCER*
Al-Tahan, A., Sarkis, O., Harajly, M., Kebbe Baghdadi, O., Zibara, K., Boulos, F., Dighe, D., Kregel, S., Bazarbachi, A., El-Sabban, M., Skapek, S. X., Saab, R.
2012; 58 (6): 877-884

- **Temporally distinct roles for tumor suppressor pathways in cell cycle arrest and cellular senescence in Cyclin D1-driven tumor** *MOLECULAR CANCER*
Zalzali, H., Harajly, M., Abdul-Latif, L., El-Chaar, N., Dbaibo, G., Skapek, S. X., Saab, R.
2012; 11: 28
- **Rhabdomyosarcoma Treatment and Outcome at a Multidisciplinary Pediatric Cancer Center in Lebanon** *PEDIATRIC HEMATOLOGY AND ONCOLOGY*
Salman, M., Tamim, H., Medlej, F., El-Ariss, T., Saad, F., Boulos, F., Eid, T., Muwakkit, S., Khoury, N., Abboud, M., Saab, R.
2012; 29 (4): 322-334
- **Senescence and pre-malignancy: How do tumors progress?** *SEMINARS IN CANCER BIOLOGY*
Saab, R.
2011; 21 (6): 385-391
- **Thrombosis in Children with Acute Lymphoblastic Leukemia Treated at a Tertiary Care Center in Lebanon: Revisiting the Role of Predictive Models** *PEDIATRIC HEMATOLOGY AND ONCOLOGY*
Al-Aridi, C., Abboud, M. R., Saab, R., Eid, D., Jeha, S., Chan, A. K. C., Muwakkit, S. A.
2011; 28 (8): 676-681
- **Bereaved Parental Evaluation of the Quality of a Palliative Care Program in Lebanon** *PEDIATRIC BLOOD & CANCER*
Saad, R., Huijjer, H., Nouredine, S., Muwakkit, S., Saab, R., Abboud, M. R.
2011; 57 (2): 310-316
- **MYOGENESIS AND RHABDOMYOSARCOMA: THE JEKYLL AND HYDE OF SKELETAL MUSCLE** *CANCER AND DEVELOPMENT*
Saab, R., Spunt, S. L., Skapek, S. X.
2011; 94: 197-234
- **L-ASPARAGINASE-INDUCED PANCREATITIS IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA: Is Allopurinol Protective?** *PEDIATRIC HEMATOLOGY AND ONCOLOGY*
Muwakkit, S., Saab, R., Yazbeck, N., Samia, L., Abboud, M. R.
2010; 27 (6): 496-501
- **Seven-Year Experience of Using Repiphysis (R) Expandable Prosthesis in Children With Bone Tumors** *PEDIATRIC BLOOD & CANCER*
Saghieh, S., Abboud, M. R., Muwakkit, S. A., Saab, R., Rao, B., Haidar, R.
2010; 55 (3): 457-463
- **Zinc and biotin deficiencies after pancreaticoduodenectomy** *ACTA GASTRO-ENTEROLOGICA BELGICA*
Yazbeck, N., Muwakkit, S., Abboud, M., Saab, R.
2010; 73 (2): 283-286
- **Severe Cerebral Vaso-Occlusive Disease in Macrophage Activation Syndrome** *PEDIATRIC NEUROLOGY*
El-Bitar, M. K., Muwakkit, S. A., Hourani, R., Abboud, M. R., Saab, R., Dabbagh, O.
2010; 42 (4): 283-286
- **Pulmonary Hypertension in Children and Young Adults With Sickle Cell Disease: Evidence for Familial Clustering** *PEDIATRIC BLOOD & CANCER*
Dahoui, H. A., Hayek, M. N., Nietert, P. J., Arabi, M. T., Muwakkit, S. A., Saab, R. H., Bissar, A. N., Jumaa, N. M., Farhat, F. S., Dabbous, I. A., Bitar, F. F., Abboud, M. R.
2010; 54 (3): 398-402
- **Cellular Senescence: Many Roads, One Final Destination** *THESCIENTIFICWORLDJOURNAL*
Saab, R.
2010; 10: 727-741
- **Wernicke's Encephalopathy during Total Parenteral Nutrition in a Child with Acute Lymphoblastic Leukemia and Acute Pancreatitis** *NEUROPEDIATRICS*
Muwakkit, S., Al-Aridi, C., Saab, R., Hourani, R., Yazbeck, N., Abboud, M.
2009; 40 (5): 249-251
- **Renal venous thrombosis in a newborn with prothrombotic risk factors** *BLOOD COAGULATION & FIBRINOLYSIS*
Muwakkit, S. A., Saab, R., Sanjad, S. A., Bhar, S. I., Ishak, R. S., Samad, Z. A., Chan, A. K., Abboud, M. R.

2009; 20 (6): 458-460

- **Comparing Children and Adults With Synovial Sarcoma in the Surveillance, Epidemiology, and End Results Program, 1983 to 2005 An Analysis of 1268 Patients** *CANCER*
Sultan, I., Rodriguez-Galindo, C., Saab, R., Yasir, S., Casanova, M., Ferrari, A.
2009; 115 (15): 3537-3547
- **Expression of the Arf tumor suppressor gene is controlled by Tgf beta 2 during development** *DEVELOPMENT*
Freeman-Anderson, N. E., Zheng, Y., McCalla-Martin, A. C., Treanor, L. M., Zhao, Y. D., Garfin, P. M., He, T., Mary, M. N., Thornton, J. D., Anderson, C., Gibbons, M., Saab, R., Baumer, et al
2009; 136 (12): 2081-2089
- **First-Line Therapy of Generalized Infantile Myofibromatosis With Low-Dose Vinblastine and Methotrexate** *PEDIATRIC BLOOD & CANCER*
Azzam, R., Abboud, M., Muwakkit, S., Khoury, N., Saab, R.
2009; 52 (2): 308
- **p18(Ink4c) and p53 Act as Tumor Suppressors in Cyclin D1-Driven Primitive Neuroectodermal Tumor** *CANCER RESEARCH*
Saab, R., Rodriguez-Galindo, C., Matmati, K., Rehg, J. E., Baumer, S. H., Khoury, J. D., Billups, C., Neale, G., Helton, K. J., Skapek, S. X.
2009; 69 (2): 440-448
- **Familial infantile pyknocytosis in association with pulmonary hypertension** *PEDIATRIC BLOOD & CANCER*
Dahoui, H. A., Abboud, M. R., Saab, R., Farra, C., Sinno, D., Dabbous, I., Muwakkit, S. A.
2008; 51 (2): 290-292
- **Epidemiology and management options for colorectal cancer in children.** *Paediatric drugs*
Saab, R., Furman, W. L.
2008; 10 (3): 177-92
- **Desmoplastic small round cell tumor in childhood: The St. Jude Children's Research Hospital experience** *PEDIATRIC BLOOD & CANCER*
Saab, R., Khoury, J. D., Krasin, M., Davidoff, A. M., Navid, F.
2007; 49 (3): 274-279
- **Pharmacologic inhibition of cyclin-dependent kinase 4/6 activity arrests proliferation in myoblasts and rhabdomyosarcoma-derived cells** *MOLECULAR CANCER THERAPEUTICS*
Saab, R., Bills, J. L., Miceli, A. P., Anderson, C. M., Khoury, J. D., Fry, D. W., Navid, F., Houghton, P. J., Skapek, S. X.
2006; 5 (5): 1299-1308
- **Osteosarcoma of the pelvis in children and young adults: The St. Jude children's research hospital experience**
Saab, R., Rao, B. N., Rodriguez-Galindo, C., Billups, C. A., Fortenberry, T. N., Daw, N. C.
WILEY-BLACKWELL.2005: 1468-1474
- **Efficacy of intravenous immunoglobulin in Landau-Kleffner syndrome** *PEDIATRIC NEUROLOGY*
Mikati, M. A., Saab, R., Fayad, M. N., Choueiri, R. N.
2002; 26 (4): 298-300
- **Successful use of intravenous immunoglobulin as initial monotherapy in Landau-Kleffner syndrome** *EPILEPSIA*
Mikati, M. A., Saab, R.
2000; 41 (7): 880-886