PATIENT-DERIVED SARCOMA MODELS TOWARDS NOVEL BIOLOGY AND TREATMENT

Patient-derived sarcoma models

- Cell line, Organoids, and PDXs

- We established the models for the following histological subtypes:
  1. Alveolar soft part sarcoma
  2. Chondrosarcoma
  3. CIC-DUX4 sarcoma
  4. Clear cell sarcoma
  5. Dermatofibrosarcoma protuberans
  6. Ewing’s sarcoma
  7. Giant cell tumor
  8. Leiomyosarcoma
  9. Lipo sarcoma
  10. Low-grade fibromyxoid sarcoma
  11. Malignant peripheral nerve tumor
  12. Myxofibrosarcoma
  13. Periosteal sarcoma
  14. Pleomorphic sarcoma
  15. Pleomorphic malignant fibrous histiocytoma
  16. Primary malignant fibrous histiocytoma
  17. Solitary fibrous tumor
  18. Synovial sarcoma
  19. Undifferentiated pleomorphic sarcoma
  20. Unclassifiable sarcoma

- We will establish the models for all histological subtypes

Multi-institutional collaboration

- [Hospital team]
  - Hospitals to collect sarcoma tumor tissues
    1. University hospitals, cancer centers, rare cancer centers
    2. Hospitals joining to the sarcoma consortium

- [Model team]
  - Researchers who are good at model development
    1. Establishment of patient-derived sarcoma model
    2. Characterization of established models

- Sarcoma models

- [Sarcoma model bank]

- To the researchers who need sarcoma models
  1. Simple way to use the models
  2. Sustainable system to provide the models

System to be created for the further model establishment

- Multi-institutions for clinical materials
- Multi-institutions for model establishment

Our model will change the future of sarcoma research

- Vicious cycle due to model shortage
  - Clinical materials are rarely available from ordinary hospitals and biobanks
  - Difficulty in addressing clinical questions and functional genomics in vitro
  - Low academic prestige
  - Low possibility for profits
  - Fewer resources and incentives to generate cancer models
  - Paucity of concrete data and low-level evidence for clinical trials
  - Low activity for research
  - Inadequate funding/investment

- Virtuous cycle for successful research with adequate models
  - Targeted and conscious efforts to generate orphan models
  - More opportunities to address clinical questions and functional genomics in vitro
  - Adequate model
  - Active research
  - Research outcome and promise of retunee to society
  - Increase of funding/investment
  - High academic and commercial value

Achievements
- We created the protocol to establish sarcoma cell lines efficiently.
- We established a substantial number of sarcoma models
- We deliver the established models to the researchers upon their requests

Issues to be addressed
- We need tumor tissues of very rare sarcomas
- We need the collaborations with experts for other model types

Adequate model will change the future of sarcoma research

We have a vicious cycle due to model shortage in the sarcoma research. We can break it by generating adequate sarcoma models and share them in the research community.