

## Patient Derived Tumor Models and Melanoma Cell Lines

To date, a number of tumor model systems have been developed and are commonly used in the preclinical studies of the disease. Established tumor cell lines have been used since the 1970s as an *in vitro* model for drug discovery. While these cell lines serve as useful tools, the continual passage of these cell lines is accompanied by extensive clonal selection and consequent loss of heterogeneity. Moreover, these cell lines lack the diagnostic value because of the absence of correlation between clinical results and *in vitro* and *in vivo* data obtained with these cell lines.

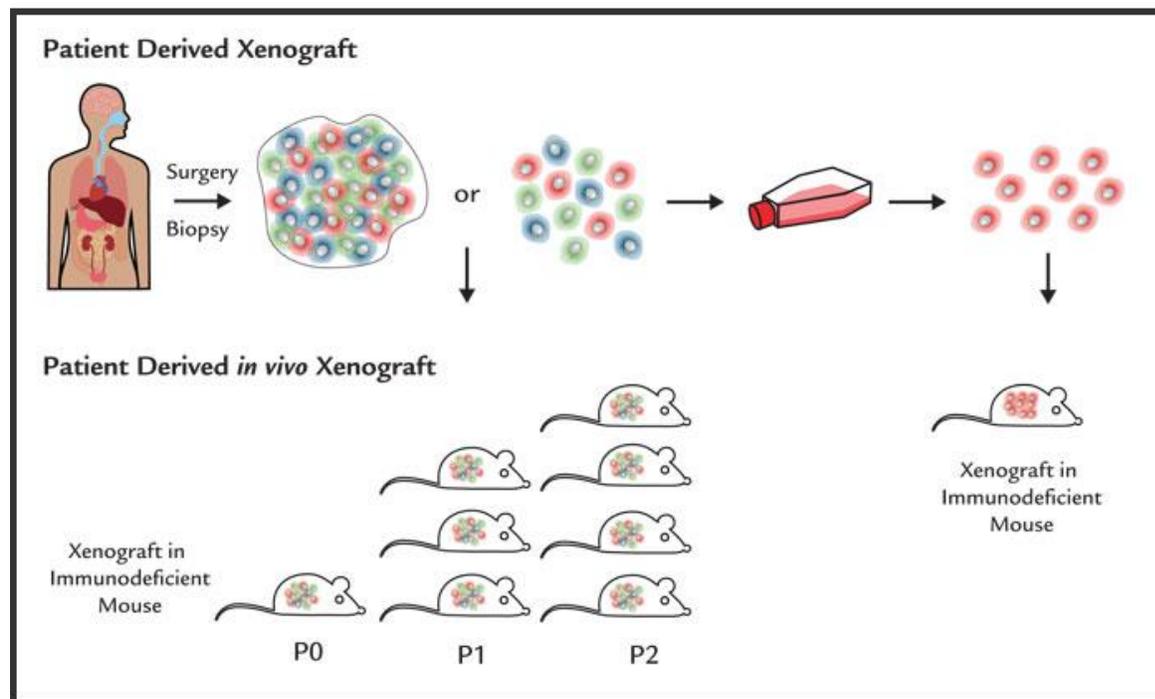
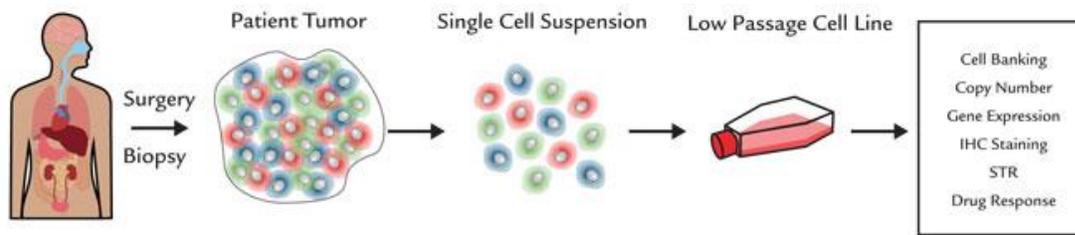
Primary cell line tumor models derived directly from patient tumors and adapted to proliferate in *in vitro* culture conditions are superior to that of established cell lines as they retain key properties found in the patient's tumor. These cell line models serve as foundation for the development and execution of highly reproducible studies under defined conditions that provide insight into drug sensitivity, basic cell biology, and the elucidation of signaling pathways.

In addition to patient derived tumor cell models, recent advances in utilizing immune deficient animal models have brought *in vivo* modeling into practice. One of the most widely used models is the patient derived xenograft (PDX) tumor model. PDX tumor models are generated by transplanting freshly resected patient tumors into immunocompromised murine hosts without an intermediate *in vitro* culture step. PDX models closely resemble the original tumors with respect to preservation of cytogenetics, cellular complexity, and glandular, vascular, and stromal architecture to that of human counterparts. Serial passage and expansion of tumor fragments or tumor cell suspensions through successive generation of murine hosts without intervening cell culture, permits ongoing propagation of tumor lines and the study of tumor biology. PDX models of melanoma, breast, ovarian, pancreatic, lung, colorectal, and brain-derived tumors have been established and have been proven to exhibit the parental tumor biology.



**TRANSCRIPT:** Preview comments by Dr. Meenhard Herlyn, D.V.M., D.Sc. regarding the relevance of validated patient derived melanoma cell lines for cancer research.

### Patient Derived Cell Lines



**Figure 1.** Development of melanoma cell lines. Explanted melanoma cells have a variety of uses including the production of patient derived tumor xenograft models.

**Rockland Immunochemicals Inc.** has partnered with the [Wistar Research Institute](#), to produce, validate and distribute a diverse panel of low passage melanoma cell lines from freshly excised metastases. More than 100 melanoma cell lines are grouped for [BRAF, N-RAS, KIT, PTEN and CDK4 mutations](#). These preclinical tumor cell line models can be used to identify the [critical target genes](#) and [pathways](#) enacted by genomic alterations and lead to a more accurate prediction of the effectiveness of novel cancer therapeutics and facilitate [cancer research](#).

#### Additional Resources:

- [Melanoma Cell Lines](#)
- [Melanoma Cell Lines with specific gene mutations](#)
- [Validation of melanoma cell lines](#)