4 Sample Management and Tracking

G. Steven Bova

4.1 Introduction

The key value provided by tissue microdissection is the separation of whole tissues into singularly defined component parts for molecular analysis. Optimal tissue microdissection occurs when the dissector possesses a singular morphological definition of target cells to be dissected, and has enough technical knowledge and ability using the dissecting tool to apply this understanding to obtain target cell material exclusive of nontarget cell material. However, obtaining pure target cells is a necessary, but not sufficient step toward converting the pure target cell material to robustly analyzable biologic data. Equally necessary for analysis are a workflow that incorporates quality control and capture of accurate metadata sufficient for proper reweaving of the biological tapestry.

Quality-controlled tissue microdissection workflow is best supported by the creation of a tissue microdissection core laboratory or its equivalent. Metadata management is best when it is cleanly integrated into the workflow, and when these data automatically become analyzable along with specific molecular data generated downstream. This chapter discusses important considerations in establishing a high-quality tissue microdissection core laboratory and in establishing appropriate management of tissue microdissection metadata.

4.2 The Tissue Microdissection Core Laboratory: Organization and Basic Data Management

At the very least, a tissue microdissection core laboratory (TMCL) provides a basis for cost-sharing for access to expensive technology needed by many laboratories in a given institution or geographic area. At its best, a TMCL can provide a nexus for the morphologic know-how of an investigator to

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synergize with the dissecting know-how of the TMCL staff, improving the odds that a given dissection will yield material of the highest quality for downstream analysis.

Based on a survey of six current TMCLs including our own, most TMCLs have only bare bones support from their institutions, and this seems unlikely to change in the near future. Rather than advocate a pie-in-the-sky solution for laboratories with limited resources, we will take a highly practical approach to suggesting ways to improve your TMCL function:

1. Create a website. This can save a lot of time in explaining the technology you have available, and help potential users plan for experiments and costs associated. Examples of current TMCL websites are contained in Table 4.1 for reference.

2. Make sure that investigators know how to document dissections and to obtain images from dissections if needed. Having a set procedure for this will save an enormous amount of time if the investigator comes back in need of data for a publication and it is not available or not well organized. At the very least, encourage investigators to document the minimal list of items contained in Table 4.2.

3. If you have enough users, invite them for occasional seminars where they can present results they have obtained using microdissection, and/or develop an e-mail list to keep users informed. This type of interaction can stimulate new ideas and further scientific knowledge.

4. If you have enough users, time, and money, establish a database for managing your LCM laboratory and related tissue management. We have created software for this purpose, currently licensed and under development by BioFortis Inc. This is described below.

5. Get feedback from researchers on the results of their dissections. If there are problems, identify their cause and report this to other users of the facility. Use this feedback to establish quality control methods.

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<th>Institution</th>
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<td>Ms. Virginia Espina</td>
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<td>Dr. Maria Tretiakova</td>
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