



Arroyo BIOSCIENCES, Inc.

**Molecular Imaging:
A Powerful Diagnostic Tool**

Even with today's advanced imaging technologies such as Ultrasound and Magnetic Resonance Imaging (MRI), soft tissue tumors can be difficult if not impossible to detect. This is especially true when the tumors are small and have not yet begun to metastasize, or spread to surrounding tissue. Fortunately, molecular imaging, through the use of specially designed and synthesized imaging agents, can aid in the detection of these tumors in their early stages, when they are most susceptible to treatment.

Rather than attempting to make the small tumors themselves more visible, imaging agents function by targeting biological pathways or processes that the tumors need in order to grow. By binding with high affinity but without chemical bonding to these biological targets, they act as signaling groups that become visible to advanced imaging technologies such as Contrast Enhanced Ultrasound, MRI, PET (Positron Emission Tomography), SPECT (Single-Photon Emission Computed Tomography) and Optical Imaging.

In order to design and synthesize an effective imaging agent, it is of course necessary to identify a specific targeting group, which could be a small molecule or peptide that is associated with a biological process involved in a disease of interest, such as cancer. It is also necessary to specify the imaging technology that will be utilized, since each different type of imaging requires a different type of signaling group.

The entire process is highly interactive, requiring close collaboration between Arroyo Diagnostics and the client for which the imaging agent is being synthesized. We begin by designing and synthesizing a number of candidate compounds that we believe will be effective, both in binding to the targeting group and in being visible to the imaging technology used to detect it. It is the responsibility of the client to confirm that each candidate retains the biological properties in which they are interested. We then select the best compound and work with trusted partners to scale up production for generation of the actual images.

As part of the process of discovering the best imaging agent, depending on the starting targeting group, we may need to do some medicinal chemistry to increase the binding ability of the compound, often by adjusting its hydrophilic or hydrophobic properties, or to improve its *in vivo* stability. This could also be of value to clients in helping them perform related therapeutic research activities.

We invite you to discuss your imaging requirements with us at the earliest stages of your research. This often allows us to offer solutions to problems before they ever occur. We look forward to working with you.