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Funding Source: National Institutes of Health Molecular Imaging Program

## **Studies of opioid and sigma receptors in peripheral organs of mice**

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Throughout the body, various receptors mediate aspects of physiology and behavior by primary or modulatory roles, with broad consequences. Of particular interest are opioid receptors of three types ( $\mu$ ,  $\delta$  and  $\kappa$ ) as well as sigma receptors having two types ( $\sigma_1$  and  $\sigma_2$ ). These receptors are distributed throughout the central nervous system and are implicated in various pathologies including brain disorders and certain cancers. One example of the clinical applications of these receptors is morphine, a famous  $\mu$  receptor agonist which has long been used for pain relief. In our lab radioligands are being developed and used for studies of these five receptors in vivo. The properties of these receptors and the pharmacology of their ligands have been studied extensively by in vitro radioligand binding techniques in brain membranes. However there have been relatively few in vitro radioligand binding studies on the peripheral organs. Consequently, we are preparing membranes from various peripheral organs of mice and screening the samples for  $\mu$ ,  $\delta$ ,  $\kappa$ ,  $\sigma_1$ , and  $\sigma_2$  receptors using well-characterized radioligands. Comparisons of the data to that obtained using mouse brain membranes will give a better understanding of the prevalence and location of these receptors in laboratory mice. The ultimate result would be a framework for extended studies of the roles played by the peripheral receptors in human health and disease.