Dr. Diana Gil Pagés' research investigates how antigen recognition by T cell receptors (TCRs) turns on cell adaptive immune function. Specifically, she is focused on the TCR-associated CD3 multiprotein complex and is the principal discoverer of the CD3 conformational change (CD3Dc) which is at the foundation of her ongoing research. Dr. Gil Pagés is studying the various levels of control exercised over CD3Dc, including structural, biochemical, developmental and physiological aspects. Her work is grounded in technical innovation and data reproducibility with an emphasis in biochemistry and primary immune cell function. She is building on the current understanding of CD3Dc to translate knowledge into in vivo therapies for metastatic cancers with focus areas on fragment antigen-binding (Fab) fragments.

Dr. Gil Pagés pioneered a new "mono-Fab" approach that allows scientists to provide CD3Dc in trans, to complement and strengthen T cell signals in response to physiological antigens presented by tumors. This innovation is a direct step toward exogenous CD3Dc provision for therapeutic application in people with T cell co-potentiation. Dr. Gil Pagés developed this novel concept that is relevant to receptor signaling, pharmacoregulation and immunotherapy. It applies when an intrinsically inert compound displays a specific latent potency, that is, it binds a receptor, producing no functional effect on the receptor or the cell bearing it but enhances signaling and cellular responses when certain, specific physiological ligands (but not others) also are engaged. In combination with other immunotherapy strategies, T cell co-potentiation may produce the best anti-metastatic tumor responses and extend the lives of cancer patients.

Dr. Gil Pagés and colleagues are currently working to establish whether co-potentiation is possible for human T cells with the hope of pursuing clinical trials to test its therapeutic value. Significance to patient care, Dr. Gil Pagés' long-term goal is to exploit the knowledge generated in the lab to develop novel strategies to manipulate T cell adaptive immune function for therapeutic purposes.