Phospholipases are ubiquitous in nature and the target of significant research aiming at both their physiological roles and technical applications in e.g. the food industry. In the search for sensitive and selective phospholipase assays, we have focused on synthetic FRET ( Förster resonance energy transfer) substrates. This has led to the development of a facile, easily scalable and low cost synthesis of fluorogenic phospholipids featuring the dansylidabcyl fluorophore/quencher-pair on the fatty acid co-position and on the phosphatidylethanolamine head group, respectively. Hence, the two substrates lyso-(dansyl-FA)-GPE-dabcyl (6) and (dansyl-FA)₂-GPE-dabcyl (7) were synthesized by a chemoenzymatic strategy, in which preparation of (6) further included a novel selective enzymatic esterification step. As proof of concept, activity of a handful of phospholipases, one from each of the PLA1, PLA2, PLC and PLO classes, were assayed using substrates (6) and (7), and the kinetic parameter $k_{cat}/K_M$ was determined. The PLA1 (Lecitase Ultra™) was found to be highly active on both substrates, whereas the PLO (from white cabbage) had no activity, presumably due to steric effects associated with the dabcyl-functionalization of the head group. It was further substantiated that the substrates are specific towards phospholipase activity as the tested lipase (Lipolase™) showed close to zero activity.