Abstract

The metabolism of ^{14}C-labeled aspartic acid, diaminopimelic acid, malic acid and threonine by isolated pea (*Pisum sativum* L.) chloroplasts was examined. Light enhanced the incorporation of [^{14}C] aspartic acid into soluble homoserine, isoleucine, lysine, methionine and threonine and protein-bound aspartic acid plus asparagine, isoleucine, lysine, and threonine. Lysine (2 millimolar) inhibited its own formation as well as that of homoserine, isoleucine and threonine. Threonine (2 millimolar) inhibited its own synthesis and that of homoserine but had only a small effect on isoleucine and lysine formation. Lysine and threonine (2 millimolar each) in combination strongly inhibited their own synthesis as well as that of homoserine. Radioactive [1,7-^{14}C]diaminopimelic acid was readily converted into [^{14}C]threonine in the light and its labeling was reduced by exogenous isoleucine (2 millimolar) or a combination of leucine and valine (2 millimolar each). The strong light stimulation of amino acid formation illustrates the point that photosynthetic energy is used *in situ* for amino acid and protein biosynthesis, not solely for CO_2 fixation.