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(54) Title: SITE–SPECIFIC ISOTOPICALLY–LABELED PROTEINS, AMINO ACIDS, AND BIOCHEMICAL PRECURSORS THEREFOR

(57) Abstract

Site–specific isotopically–labeled valine, leucine, and isoleucine and biosynthetic precursors for these amino acids are provided. The amino acids are labeled with ^{13}C or ^{14}C at the methyl group carbon atom(s) most remote from the carboxyl group. Also disclosed are the biochemical precursors of these labeled amino acids, 2–keto–4–(^{n}C)butyric acid and 2–keto–3–(^{n}C–methyl)–4–(^{n}C)–butyric acid in which n, at each occurrence, is 13 or 14. Also disclosed are proteins, protein fragments, and polypeptides containing these site–specifically isotopically labeled amino acids, and methods for preparing the biochemical precursors, the amino acids, and the proteins, protein fragments, and polypeptides.