

SHORT-CHAIN POLYPEPTIDE TEST (SCPP's)

This is a test that is particularly useful when looking for evidence or confirmation of either increased intestinal permeability (leaky gut syndrome) or inadequate digestion (enzymes and acid). Amino acids are the basic building blocks of very large molecules called proteins. When two or more amino acids are joined together they are called peptides. So called 'short-chain polypeptides' are up to around 30 amino acids long. Many hormones, cytokines, chemotactic agents and CNS-active metabolites are SCPP's.

The process of digestion breaks down proteins and peptides to amino acids. When digestion working well and the intestinal mucosa (lining) is in good shape, structurally and functionally, amino acids are readily absorbed, while peptides and proteins are mainly excluded. When digestion is impaired or there is increased intestinal permeability, then peptides, being relatively small molecules, are easily absorbed into circulation in greater amounts than usual.

SCPP's can mimic hormones and moderators of immune function. They can also affect CNS metabolism and further disturb endocrine function through inappropriate feedback signals to the pituitary.

WHAT THE TEST MEASURES

This test measures the amount of SCPP's in venous blood. There are too many of these substances to measure them individually, so the results are reported as the total concentration of SCPP's for 12 groups according to the number of amino acids: dipeptides, tripeptides, 4 amino acids, 5, 6, 7, 8, 9&10, 11-14, 15-20, 21-30, >30 amino acids. See over the page for a list of examples of polypeptides in each of these size groupings. Reference ranges are provided for adult males, adult females and for pre-puberty children aged 3 years and over. The test is not appropriate for babies.

WHAT THE TEST INVOLVES

A blood sample is taken **2 hours after a meal that includes plenty of protein**. The foods chosen should reflect the usual main meal of the day and have regard for any dietary restrictions already in place. Failure to do this can lead to false negative findings.

TEST INTERPRETATION

Increases in SCPPs are associated with digestive problems and/or increased gut permeability. However, raised levels are sometimes found in patients without any clinical evidence of gut dysfunction.

TEST INDICATIONS

- Increased intestinal permeability - 'leaky gut syndrome'
- Suspicion of impairment of digestion affecting protein digestion:
- Insufficiency of pancreatic enzymes, and/or
- Reduced gastric acid production
- Unexplained endocrine disorders
- Unexplained immune dysfunction

LABORATORIES

- Acumen £60 (with gel electrophoresis for identification of discrete peptides, if indicated)
- Biolab £88

LIST OF SOME POLYPEPTIDES OF CLINICAL SIGNIFICANCE, ACCORDING TO SIZE

One of the effects of increased small intestinal permeability is increased absorption of peptides which may then mimic normal vital peptides, including hormones, neurotransmitters, etc. Below is a list of examples of some of the peptides for each size grouping measured in the test - remember this is only a very partial list, by way of example.

2 amino acids (dipeptides): Amino acid agonists, RNA binding substances, TRY-GLY (pituitary feedback hormone), neuroactive peptides and simple chemotactic peptides.

3 amino acids (tripeptides): Some chemotactic peptides, brain enkephalin fragments, neurotransmitters, thymosin 25-27 fragment, DNA binding peptides, dipeptidase inhibitors, anti-reproductive peptides.

4 amino acids: Numerous chemotactic peptides, bioactive enkephalin fragments, fibrinectin fragments.

5 amino acids: Bradykinin 1-5 fragment, some chemotactic peptides, enkephalins, protease inhibitors and appetite suppressants.

6 amino acids: ACTH fragments, CRP fragments, bradykinin 1-6 and 2-7 fragments, pentagastrin, sex agglutination peptide and some cell-specific chemotactic peptides.

7 amino acids: Angiotensin-3, bradykinin, bombesin 8-14 fragment, and opioid peptides including casomorphin.

8 amino acids: ACTH fragments, angiotensin-2, angiotensin-2-antipeptide, bradykinin 2-9 fragment, glucagon 30-37 fragment and opioid peptides including dermorphin.

9 and 10 amino acids: ACTH fragments, angiotensin-1, dinorphin-A fragments, antidiuretic hormone, anti-inflammatory peptide, fibrinectin-related-peptide, kinotensin, isotocin, oxytocin, sleep-inducing peptide and vasotocin (prolactin stimulating hormone),.

11 - 14 amino acids: Dynorphin B, bombesin, fibrinopeptide B, cholecystokinin 10-20 fragment, LH-RH, neurotensin, somatostatin, substance P (neuro-transmitter), CRP fragments, small-cardioactive peptide, and neurokinin (broncho-constrictor).

15 - 20 amino acids: alpha-endorphin, gamma-endorphin, gastrin bioactive fragments, mini-gastrin, pancreastatin bioactive fragments, and fibrinopeptidase-A.

21 - 30 amino acids: Atrial natriuretic peptide, melanocyte stimulating hormone, galanin, motilin, tumour necrosis factor fragments, gastrin-releasing hormone, glucagon, secretin, vasoactive intestinal peptide, protein kinase and endothelins,

Over 30 amino acids: ACTH, beta-endorphin, gastric-inhibitory peptide, big gastrin, pre-glucagon, neuropeptide Y, pancreatic polypeptide, peptide YY (secretin inhibitor), growth hormone releasing factor, PTH, adrenomedullin, aldosterone inhibitor, brian natriuretic peptide, calcitonin, HCG bioactive fragments, corticotrophin-releasing factor, C-peptide, defensin, diabetic associated peptide, insulin, thyrocalcitonin, transforming growth factor, urocortin, xenopsin-25, and numerous cytokines, leukotrienes etc.