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Plant Gene Register PGR 98–051

**Cloning and Sequencing of Two Isoforms of Serine Hydroxymethyltransferase from *Flaveria pringlei* (Accession Nos. Z25859 and Z25860).**

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Plant Gene Register PGR 98–052

**An Elongation Factor 1-Alpha Gene from Cassava (*Manihot esculenta* Crantz.) (Accession No. AF041463).**

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Plant Gene Register PGR 98–053

**A cDNA from Tomato (*Lycopersicon pennellii*) Encoding Ribulose-1,5-Bisphosphate Carboxylase/Oxygenase Activase (Accession No. AF037361).**

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estry, Oklahoma State University, Stillwater, Oklahoma 74078.

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Plant Gene Register PGR 98–054

**Identification of a Novel Globulin-Like Protein Gene, GEA8 (Accession No. U47078) from Carrot Somatic Embryos.**

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Plant Gene Register PGR 98–055

**Structure of Dihydrofolate Reductase-Thymidylate Synthase Gene (Accession No. AJ003139) from *Daucus carota*.**

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Plant Gene Register PGR 98-065

**Cloning and Characterization of PSR5, a Tomato cDNA (Accession No. Y14339) Encoding a 20S Subunit from the Proteasome Repressed by Phosphate Starvation.**

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Plant Gene Register PGR 98-066

**cDNA Sequence for an Acyl Carrier Protein from Actinorhizal Nodules of *Casuarina glauca* (Accession No. Y10994).**

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Plant Gene Register PGR 98-067

**A Full-Length cDNA Clone from *Brassica napus* Encoding a Multifunctional Enzyme of the Glyoxysomal Fatty Acid Beta-Oxidation (Accession No. AJ000886).**

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Plant Gene Register PGR 98-068

**A Full-Length cDNA Clone from *Brassica napus* Encoding Expansin (Accession No. AJ000885).**

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Plant Gene Register PGR 98-069

**Isolation and Characterization of a cDNA Sequence CanSMT3 (Accession No. AJ001901) from *Cicer arietinum* L. Epicotyls.**

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Plant Gene Register PGR 98-070

**Flavanone 3-Hydroxylase (Accession No. AF036093) Cloning and Sequencing from *Nicotiana tabacum*.**

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# Plant Gene Register PGR98-069

Francisco J. Muñoz, Berta Dopico, and Emilia Labrador (1998) Isolation and Characterization of a cDNA Sequence CanSMT3 (Accession No. AJ001901) from *Cicer arietinum* L. Epicotyls (PGR98-069). Plant Physiol. 116: 1605

## Isolation and Characterization of a cDNA Sequence CanSMT3 (Accession No. AJ001901) from *Cicer arietinum* L. Epicotyls

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We report here the nucleotide sequence of a cDNA isolated from a cDNA library constructed from mRNA from 5-day-old chickpea epicotyls (*Cicer arietinum* L cv castellana). A small ORF of 345 was found to encode a putative protein of 115 aa that shows a significant homology with *Arabidopsis thaliana* SMT3 (Accession Number X99609, 77.9% similarity) and *Oryza sativa* SMT3 (X99608, 74.0%). Based on this finding this novel cDNA sequence was termed CanSMT3. Homologous sequence were also found in protozoa, metazoa, yeast and in human, where a new human gene family have been suggested. Although the function of the product of these gene have not been established in plants, a role of SMT3 as centromeric protein has been proposed in *Saccharomyces cerevisiae* (Meluh and Koshland, 1995a, b) and an involvement of the human SMT3A encoded protein in the function and/or structure of the eukaryotic kinetochore has been suggested (Lapenta *et al.* 1997). Taking in mind the strong evolutionary conservation of the SMT3, a similar function in plant could be suggested.

All predicted proteins from these SMT3 clones showed some homology to ubiquitin, and thus, the products of these genes have been designed as ubiquitin-like proteins. Ubiquitin is a small protein of about 76 amino acids whose sequence is identical among every higher plants (Callins and Vierstra, 1989), and differs from ubiquitin sequences of other eucaryotic organisms by one to three aminoacids. Ubiquitin has been implicated in many cellular processes, such as protein turnover, chromatin structure, cell cycle control, DNA repair and response to different stresses (Monia *et al.* 1990). Based on the observed similarity, it has been suggested that SMT3 product may be included in the growing family of ubiquitin-related proteins (Lapenta *et al.* 1997). Database searches revealed low-level of homology between CanSMT3 predicted protein and ubiquitin (14% similarity).

In chickpea, CanSMT3 is constitutively expressed, as have been shown by Northern experiments. The level of expression was similar in every organs of chickpea seedlings and also at different stages of epicotyl growth.

### Acknowledgements

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### Table I. Characteristics of CanSMT3 from *Cicer arietinum*

Organism:

*Cicer arietinum* L. cv. castellana

Clone Type, Designation:  
cDNA, full length, CanSMT3

Source:  
cDNA library in lambda-ZAP constructed from poly A+ RNA from *Cicer arietinum* 5-day-old epicotyls.

Gene identification:  
Nucleotide and amino acid sequence comparisons to published sequences in GenBank and EMBL data bases and Swiss-Prot and Blitz data bases respectively.

Feature of the cDNA:  
The clone is 542 bp in length, including a complete ORF of 345 bp, 15-bp 5' untranslated sequence and 182-bp 3' untranslated sequence.

Features of deduced protein:  
The ORF encodes a 115 amino acid polypeptide. The encoded protein has a predicted molecular mass of 12.8 kD and a isoelectric point of 4.73. Acidic aminoacids present the highest percentage: Asp (9.85%) and Glu (9.04%).

Gene product:  
Ubiquitin-like protein.

#### Literature cited

**Callins J, Vierstra RD** (1989) Ubiquitin and ubiquitin genes in higher plants. *Oxford Surv Plant Mol Cell Biol* **6**:1-30

**Lapenta V, Chiurazzi P, Van der Spek P, Pizzuti A, Hanaoka F, Brahe C** (1997) SMT3A, a human homologue of the *S. cerevisiae* SMT3 gene, maps to chromosome 21qter and defines a novel gene family. *Genomics* **40**: 362-366

**Meluh PB, Koshland D** (1995a) Suppressors of MIF2, a putative centromere protein gene in *Saccharomyces cerevisiae*. *Mol. Biol. Cell* **6**: 360a

**Meluh PB, Koshland D** (1995b) Evidence that the MIF2 gene of *Saccharomyces cerevisiae* encodes a centromere protein with homology to the mammalian centromere protein CENP-C. *Mol. Biol. Cell* **6**: 793-807.

**Monia BP, Ecker DJ, Crooke ST** (1990) New perspective on the structure and function of ubiquitin. *Biotechnology* **8**:209-215



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