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## An update of the S100 nomenclature

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### Abstract

The plethora of names given to S100 proteins resulted in considerable confusion. Here we present the official and updated nomenclature of this protein family, approved by the HGNC (HUGO gene nomenclature committee) and ECS (European Calcium Society).

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The plethora of names given to the early members of the S100 family, which resulted in considerable confusion in this field of research, prompted Schaefer et al. [1] to introduce the nomenclature of the S100 family. Although agreed upon by the European Calcium Society (ECS) and approved by the HUGO gene nomenclature committee (HGNC), there seems to be an addiction to continue with confusion in this field. Just recently, several S100 loci needed to be renamed according to the established nomenclature of the S100 family [2]. Nevertheless, Zimmer et al. [3] again pointed to discrepancies in the S100 nomenclature, the source of which was an article describing three allegedly new S100 genes (S100A15, S100A16 and S100A17) within the S100 gene cluster on human chromosome 1q21 [4]. One of these genes (S100A15) had already been published with the approved gene symbol S100A16 [5] (see Table 1). The remaining two (designated S100A16 and S100A17) are not S100 family members but belong to the “fused” gene family (approved gene nomenclature: HRNR, hornerin and TCHHL1, trichohyalin-like 1 respectively). Although carrying the S100 specific EF-hand motif at the N-terminus, proteins of the fused family are characterized by a

large repeat domain, which represents the majority of the protein. Due to this structural singularity, which most likely has its origin in an early gene fusion, the members of this family should not be classified as S100 proteins but as a separate family.

Four S100 gene symbols have now been changed according to the functional relevance and phylogenetic relationships of the genes. S100A7L1/S100A15 was renamed S100A7A to indicate its high homology with S100A7. S100A15 has been withdrawn as an official gene symbol and will not be used for any future S100A genes. Because S100A7L3 and S100A7L4 are non-coding genes, their new gene symbols are S100A7P1 and S100A7P2 respectively. Finally, CALB3 (calbindin 3) has been renamed S100G, to make its affiliation to the S100 family more obvious.

We hope that the nomenclature approved for the S100 gene family listed in the attached table will be followed in future publications and discussions. For more details about HGNC approved nomenclature please see <http://www.gene.ucl.ac.uk/nomenclature/index.html>.

### References

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Table 1  
Nomenclature and chromosomal location of the S100 genes

| Approved gene symbol | Approved gene name                           | Previous symbols and aliases  | Chromosomal location | Sequence Accession ID |
|----------------------|--|---|----------------------|-----------------------|
| S100A1               | S100 calcium binding protein A1              | S100A, S100-alpha   | 1q21                 | NM_006271             |
| S100A2               | S100 calcium binding protein A2              | S100L, CaN19  | 1q21                 | NM_005978             |
| S100A3               | S100 calcium binding protein A3              | S100E   | 1q21                 | NM_002960             |
| S100A4               | S100 calcium binding protein A4              | Calvasculin, metastasin, murine placental homolog, calcium placental protein (CAPL), MTSI, p9Ka, 18A2, pEL98, 42A | 1q21                 | NM_002961             |
| S100A5               | S100 calcium binding protein A5              | S100D   | 1q21                 | NM_002962             |
| S100A6               | S100 calcium binding protein A6              | Calcyclin (CACY), 2A9, PRA, CABP  | 1q21                 | NM_014624             |
| S100A7               | S100 calcium binding protein A7              | Psoriasis 1 (PSOR1), S100A7c  | 1q21                 | NM_002963             |
| S100A7A              | S100 calcium binding protein A7A             | S100A15, S100A7L1   | 1q21                 | NM_176823             |
| S100A7L2             | S100 calcium binding protein A7-like 2       | S100A7b   | 1q21                 | –                     |
| S100A7P1             | S100 calcium binding protein A7 pseudogene 1 | S100A7L3, S100A7d   | 1q21                 | –                     |
| S100A7P2             | S100 calcium binding protein A7 pseudogene 2 | S100A7L4, S100A7e   | 1q21                 | –                     |
| S100A8               | S100 calcium binding protein A8              | Calgranulin A (CAGA), CGLA, P8, MRP8, CFAG, LIAg, 60B8AG  | 1q21                 | NM_002964             |
| S100A9               | S100 calcium binding protein A9              | Calgranulin B (CAGB), CGLB, P14, MRP14, CFAG, LIAg, 60B8AG  | 1q21                 | NM_002965             |
| S100A10              | S100 calcium binding protein A10             | Annexin II ligand (ANX2LG), calpactin I, light polypeptide (CAL1L), p11, CLP11, 42C                               | 1q21                 | NM_002966             |
| S100A11              | S100 calcium binding protein A11             | Calgizzarin, S100C  | 1q21                 | NM_005620             |
| S100A11P             | S100 calcium binding protein A11 pseudogene  | S100A14   | 7q22–q31             | –                     |
| S100A12              | S100 calcium binding protein A12             | Calgranulin C (CAGC), CAAF1, CGRP, p6, ENRAGE   | 1q21                 | NM_005621             |
| S100A13              | S100 calcium binding protein A13             |   | 1q21                 | NM_005979             |
| S100A14              | S100 calcium binding protein A14             | BCMP84, S100A15   | 1q21                 | NM_020672             |
| S100A16              | S100 calcium binding protein A16             | S100F, DT1P1A7, MGC17528  | 1q21                 | NM_080388             |
| S100B                | S100 calcium binding protein B               | S100-beta   | 21q22                | NM_006272             |
| S100G                | S100 calcium binding protein G               | Calbindin 3 (CALB3), CaBP9K, CABP1  | Xp22                 | NM_004057             |
| S100P                | S100 calcium binding protein P               |   | 4p16                 | NM_005980             |
| S100Z                | S100 calcium binding protein Z               | S100-zeta   | 5q13                 | NM_130772             |

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