derepression of the fusion gene and of endogeneous *Ubx*: β-galactosidase staining appears weak anteriorly and strong posteriorly, whereas antibody staining is even throughout. But the extension of the derepressed domain is the same in both cases and most probably corresponds to the addition of the normal *Ubx* and *abd-A* expression domains. We conclude that functional *abd-A* product determines the posterior limit of normal *Ubx* expression in the visceral mesoderm. Interestingly, neither the second nor the third midgut constriction can form properly in *abd-A*$^-$ mutant embryos (Fig. 2*j–l*), suggesting that the formation of these constrictions depends on adjacent domains of differential homeotic gene activity in the visceral mesoderm.

The *Abdominal-B* (*Abd-B*) product functions to down-regulate *Ubx* expression in the posterior ectoderm[8]. In contrast, we find that an *Abd-B* null mutation[14] (*Abd-B*^{M1}) does not affect *Ubx* expression in the visceral mesoderm, although the effect of this mutation is clearly apparent in ps13 of the ectoderm (Fig. 2*b*). We find unexpectedly that, in the absence of functional *abd-A* product, *Abd-B* can activate the fusion gene ectopically: β-galactosidase staining appears in the visceral mesoderm of the posterior midgut in *Ubx*$^-$ *abd-A*$^-$ double mutant embryos (Fig. 2*g*). This ectopic β-galactosidase staining is abolished in triple mutants (*Ubx*$^-$ *abd-A*$^-$ *Abd-B*$^-$) and is therefore dependent on functional *Abd-B* product (Fig. 2*h*). The ectopic β-galactosidase staining domain probably corresponds to the *Abd-B* expression domain, implying that *abd-A* and *Abd-B* expression coincides in the posterior visceral mesoderm. It appears that *Abd-B* does not have any repressor function in this germ layer.

We have shown that, in the absence of functional *Ubx* product, the *Ubx* gene cannot be expressed in ps7, whereas, in the absence of functional *abd-A* product, *Ubx* expression cannot be repressed posterior to ps7 in the visceral mesoderm (Fig. 3). The targets for *Ubx* autocatalysis and *abd-A* represssion are evidently present on the *Ubx*/*βgal* fusion gene, and it is possible that these regulatory mechanisms are mediated by direct DNA binding[17] of the Ubx and abd-A homeoproteins to *Ubx* promoter sequences. It appears that in the visceral mesoderm autocatalysis and exclusion[2,3] are important for the establishment and/or the maintenance of adjacent domains of homeotic gene expression. Whether these mechanisms also act in the ectoderm where expression domains of different homeotic genes partly overlap[1] is unclear. Indication for autocatalysis in the ectoderm has been obtained for *fushi tarazu* expression[18], although in this case there is no evidence for exclusion by the adjacent gene *even-skipped*[19].

It is puzzling that only the posteriorly adjacent gene *abd-A*, but not the anteriorly adjacent gene *Antp*, excludes *Ubx* expression in the visceral mesoderm. It is possible that the anterior limit of the *Ubx* expression domain in this germ layer is determined by an additional regulatory protein that provides a positional value with respect to the antero-posterior axis. This hypothetical regulator may be present at low concentration anteriorly and at high concentration posteriorly and allow *Ubx* expression only above a certain threshold concentration. The posterior limit of *Ubx* expression could be determined by the exclusion function of the *abd-A* gene.

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Erratum

A new superfamily of replicative proteins

T C Hodgman
Nature **333**, 22–23 (1988).

In this piece of Scientific Correspondence, an unrevised version of the figure was used in error. The correct version is reproduced on the right.

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Motif             I                                      II              III           IV                   V                 VI     Source
                                                                                                                                       ref.
AlMV    821 VDGVAGCGKTTNIK                        55 RLIFDECFLQH 15 VIGFGDTEQIPF 22 ITWRSPADA  66 IFTTHE-AQGK-TFDNVYFCR 19 NGLVALSRH ( 1)
BMV     687 VDGVAGCGKTTAIK                        54 RLLVDEAGLLH 15 VLAFGDTEQISF 22 KTYRCPQDV  78 IKTVHE-AQGI-SVDNVTLVR 13 YCLVALTRH ( 1)
CMV     709 VDGVAGCGKTTAIK                        54 RVLVDEVVLLH 15 ALCFGDSEQIAF 22 TTFRSPQDV  79 IKTVHE-SQGI-SEDHVTLVR 13 YCLVAVTRH ( 1)
TMV     829 VDGVPGCGKTKEIL                        57 RLFIDEGLMLH 15 AYVYGDTQQIPY 24 TTLRCPADV  62 VHTVHE-VQGE-TYSDVSLVR 14 HVLVALSRH ( 1)
ToMV    829 VDGVPGCGKTKEIL                        57 RLFIDEGLMLH 15 AYVYGDTQQIPY 24 TTLRCPADV  62 VHTVHE-VQGE-TYADVSLVR 14 HVLVSLSRH (17)
TRV     901 VDGVPGCGKSTMIV                        56 VLHFDEALMAH 15 CICQGDQNQISF 24 ETYRSPADV  64 VSTVHE-SQGE-TFKDVVLVR 13 YLIVALSRH ( 1)
SFV     183 VFGVPGSGKSAIIK                        50 ILYVDEAFACH 16 VVLCGDPKQCGF 21 ISRRCTRPV  58 VMTAAA-SQGL-TRKGVYAVR 14 HVNVLLTRT ( 1)
SV      183 VIGTPGSGKSAIIK                        50 VLYVDEAFACH 16 VVLCGDPMQCGF 24 ISRRCTQPV  58 VMTAAA-SQGL-TRKGVYAVR 14 HVNVLLTRT ( 1)

IBV    1209 VQGPPGSGKSHFAI                        54 ILLVDEVSMLT 15 VVYVGDPAQLPA 30 KCYRCPKEI  82 VQTVDS-SQGS-EYDYVIFCV 11 RFNVALTRA (18)

BNYVV1  893 VKGGPGTGKSFLIR                        48 IIFVDEFTAYD 11 IYLVGDEQQTGI 25 MNFRNPVHD  72 KTTVRA-NQGS-TYDNVVLPV 12 LNLVALSRH (19)
BNYVV2  121 VLGAPGVGKSTSIK                        49 TMLVDEVTRVH 11 VICFGDPAQGLN 18 ASRRFGKAT  67 SILYSD-AHGQ-TYDVVTIIL 13 VRAVLLTRA (19)
BSMV2   267 ISGVPGSGKSTIVR                        41 LLIIDEYTLAE 11 VLLVGDVAQGKA 18 TTYRLGQET  62 CALAID-VQGK-EFDSVTLFL 12 LRLVALSRH (20)

uvrD     26 VLAGAGSGKTRVLV 17 MAVTF-TNKAAAEMRHRI 140 NILVDEFQNTN 16 VMIVGDDDQSIY 26 QNYRSTSNI 267 LMTLHS-AKGL-EFPQVFIVG 23 LAYVGVTRA (21)
rep      19 VLAGAGSGKTRVIT 17 AAVTF-TNKAAREMKERV 141 YLLVDEYQDTN 16 FTVVGDDDQSIY 26 QNYRSSGRI 271 LMTLHA-SKGL-EFPYVYMVG 22 LAYVGITRA ( 2)
recB     20 IEASAGTGKTFTIA 25 LVVTF-TEAATAELRGRI 303 VAMIDEFQDTD 18 LLLIGDPKQAIY 24 TNWRSAPGM 286 IVTIHK-SKGL-EYPLVWLPF 44 LLYVALTRS ( 4)
recD    164 ISGGPGTGKTTTVA 17 RLAAP-TGKAAARLTESL  48 VLVVDEASMID 16 VIFLGDRDQLAS 24 QLSRLTGTH 198 AMTVHK-SQGS-EFDHAALIL 11 LVYTAVTRA (22)

EBV      69 ITGTAGAGKSTSVS  7 CVITGTTVIAAQNLSAIL  88 VIVVDEAGTLS 26 IVCVGSPTQTDA 44 NNKRCTDVQ 426 AMTIAK-AQGL-SLNKVAICF  9 HVYVALSRA (23)
HCMV    117 VTGTAGAGKTSSIQ  7 CLVTGATTVAAQNLSQTL 100 IIVIDECGLML 26 IICVGSPTQTEA 44 HNKRCTDLD 513 AMTIAK-SQGL-SLEKVAVDF 10 HIYVAMSRV
HSV      94 ITGNAGSGKSTCVQ  7 CVVTGATRIAAQNMYAKL 111 VIVIDEAGLLG 26 LVCVGSPTQTAS 44 NNKRCVEHE 442 AMTITR-SQGL-SLDKVAICF  8 SAYVAMSRT ( 6)
VZV      87 ISGNAGSGKSTCIQ  7 CIITGSTRVAAQNVHAKL 110 VIVIDEAGLLG 26 IVCVGSPTQTDS 44 NNKRCQEDD 447 AMTIAR-SQGL-SLEKVAICF  8 SVYVAMSRT (24)

PIF     255 YTGSACTGKSILLR  7 VAVTASTGLAACNIGGTI  21 ALVVDEISMLD 25 LIFCGDFFQLPP 29 KVFRQRGDV 219 MQTIHQNSAGKRRLPLVRFKA 33 QAYVALSRA ( 5)
              *  * ***          *   * *** **   *      ******         *****  *        *****          ***  ***  *   * * *      *******
Residue     V G AG GKS          VT  T  AA N    L        VDE             GD  Q          R            T    SQG  E   V           VALSR
distribn.   I A P    T          IA      T E    I        I                S                          L    AK   S   A           TLVT
            Y                   A         R    V        F                                                VH   T                GM
                                                                                                         NA   R                SI
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