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## Calcium- and BTB domain protein-modulated PINOID protein kinase directs polar auxin transport

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PINOID kinase directs polar auxin transport**

Hélène Robert-Boisivon

Cover      Inflorescence of *pinoid-14 pinoid binding protein1-1* (front cover)  
GFP:FABD localization in Arabidopsis root hairs at the hypocotyl-root junction  
(back cover)  
GFP:FABD line was kindly provided by Tijs Ketelaar, Plant Cell Biology Lab.,  
Wageningen University.  
Designed by Martin Brittijn

Invitation      Pin-like structure of *pinoid-14*

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# **Calcium- and BTB domain protein-modulated PINOID kinase directs polar auxin transport**

Proefschrift

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“Calcium- and BTB domain protein-modulated PINOID kinase directs polar auxin transport”  
by Hélène Robert-Boisivon

A ma p'tite KRob,  
du plaisir que j'ai à la retrouver tous les soirs ;  
A mon Grand Homme à la Maison,  
pour son soutien durant ces années de labeur.



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**List of abbreviations**

ATP	Adenosine tri-phosphate
ATTERT	<i>Arabidopsis thaliana</i> telomerase reverse transcriptase
BB	Binding buffer
BELL	BEL1-like homeobox protein
BET/GTE	Bromodomain and extraterminal domain protein/Global transcriptional factor group E
BP	BREVIPEDICELLUS
BSA	Bovine serum albumin
BTB	Broad-Complex, Tramtrack, Bric-a-brac domain
BT	BTB and TAZ domain protein
Ca <sup>2+</sup>	Calcium
CaD	Catalytic domain
Cam	Chloramphenicol
CaM/CaML	Calmodulin/calmodulin-like
CaMBD	Calmodulin binding domain
Cb	Carbenicillin
CBP	p1300/CREB binding protein
cDNA	Complementary DNA
CDPK	Calcium-dependent protein kinase
CFP	Cyan Fluorescent protein
CHZ	Chalazal pole
Col	Columbia
cort	Cortex cells
CSy	Collapsed synergid cell
CT	C-terminal
CUL3	Cullin 3
dag	Days after germination
DIC	Differential interference contrast
DMSO	Dimethyl sulfoxide
DNA	Deoxyribonucleic acid
Ds element	Dissociation element
EB	Extraction buffer
EC	Egg cell
EDTA	Ethylene diamine tetra-acetic acid
ENP	Enhancer of PINOID
EOL	ETO1-like
ep	Epidermis cells
EtBr	Ethidium bromide
ETO1	Ethylene overproducer1
FG	Female gametophyte development stage
FMN	Flavin mononucleotide
FRET	Förster (fluorescence) resonance energy transfer
gDNA	genomic DNA
<i>gfa</i>	GAMETOPHYTIC FACTOR
GFP	Green fluorescent protein

## Abbreviations

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GST	Glutathione S-transferase
GT	Gene trap
GUS	(beta-) glucuronidase
h	hour
HEPES	4-(2-Hydroxyethyl)piperazine-1-ethanesulfonic acid
His	Histidine
Hm	Hygromycin
hpPBP1H	hairpin RNA spanning the complete PBP1H coding region
HRP	Horse radish peroxidase
IAA	3-Indoleacetic acid, natural auxin
IPTG	Isopropyl $\beta$ -D-1-thiogalactopyranoside
JLO	JAGGED LATERAL ORGANS
KCBP	Kinesin-like calmodulin-binding protein
KIC	KCBP-interacting calcium-binding protein
KIPK	KCBP-interacting protein kinase
Km	Kanamycin
KNOX	KNOTTED-1 like homeobox proteins
KRP	KIC-related protein
La	Lanthanum
LB	Lysis buffer
LC	Luria–Bertani medium containing 10 mM MgSO <sub>4</sub> and 5 mM CaCl <sub>2</sub>
<i>Ler</i>	Landsberg <i>erecta</i>
LOB domain	Lateral organ boundaries domain
LOV domain	light, oxygen, or voltage domain
MAB4	MACCHI-BOU4
MADS box	MCM1, AGAMOUS, DEFICIENS and SRF box
MATH domain	Meprin and TRAF-C homology domain
MBP	Myelin basic protein
MC	Micropyle pole
min	minute
ml	milliliter
mM	millimolar
MT	microtubules
MYB domain	Myeloblastosis domain
NAA	1-naphthaleneacetic acid, synthetic auxin
NASC	Nottingham Arabidopsis Stock Centre
NES	Nuclear export signal
NLS	Nuclear localization signal
nm	nanometer
NPA	1-naphthylphthalamic acid
NPH3	NON-PHOTOTROPIC HYPOCOTYL3
NPY1	NAKED PINS IN YUC MUTANTS1
NT	N-terminal
(Ni-)NTA	Nickel nitrilotriacetic resin
PAT	Polar auxin transport
PBP1/PBP1H	PINOID BINDING PROTEIN1/PINOID BINDING PROTEIN1 HOMOLOGUE

PBP2	PINOID BINDING PROTEIN2
PBS	Phosphate buffer saline
PCR	Polymerase chain reaction
PDK1	3-phosphoinositide-dependent protein kinase1
PDVF	Polyvinylidene Difluoride
PHOT	Phototropin
PID	PINOID
PIF	PDK-interacting fragment
PIN	PIN-FORMED
PKA	Protein kinase A
PKC	Protein kinase C
PKG	Protein kinase G
PMSF	Phenylmethanesulfonyl Fluoride
PN	Polar nuclei
PNF	POUND-FOOLISH
PNY	PENNYWISE
PP2A	Protein phosphatase 2A
<i>pro</i>	promoter
Rif	Rifampicin
(m)RNA	(Messenger) riboxynucleic acid
RNAi	RNA interference
ROC	ROTAMASE CYLOPHILIN protein
ROI	Region of interest
RPS5A	RIBOSOMAL. PROTEIN S5A
RPT2	ROOT PHOTOTROPISM2
RT-PCR	Reverse transcriptase-PCR
SAM	Shoot apical meristem
SDS	Sodium Dodecyl Sulfate
SDS-PAGE	SDS-poly acrylamide gel electrophoresis
Spc	Spectinomycin
STM	SHOOTMERISTEMLESS
Sy	Synergids
TAC1	TELOMERASE ACTIVATOR1
TAZ/POZ	Transcriptional adaptor zinc finger/Pox virus zinc finger
Tc	Tetracain
TCH3	TOUCH3
T-DNA	Transfer-DNA
TIR	TRANSPORT INHIBITOR RESPONSE1
UPN	Unfused polar nuclei
YFP	Yellow fluorescent protein
ZZ	Zinc
$\alpha$ TUB	alfa Tubulin
$\mu$ g	microgram
$\mu$ l	microliter
$\mu$ m	micrometer
$\mu$ M	micromolar

