Supporting Information

Reflectin 1A [Euprymna scolopes] AAQ21389:
MNRFMNRYRPMFNNMYSNMYRGRYRGM**MEPMSRMTMDFQGRYMDSQGRM**VDPRYYDYYGRFNDYD
RYYGRSMFNYGWMMDGDRYNRYNRW**MDYPERYMDMSGYQMDMSGRWMDMQGRHC**NPYSQWMM
YNYNRHGYYPNYSYGRHMFYPERW**MDMSNYSMDMYGRYMDRWGRY**CNPFSQYMNYYGRYWNYPGYN
NYYYSRNMYYPERY**FDMSNWQMDMQGRWMDNQGRY**CSPYWNNWYGRHMYYPYQNNYFYGRYDYPG
MDYSNYQMDMQGRYMDQYGMNDYYY

Reflectin 2A [Euprymna scolopes] AAQ21392:
MNRYMTRFRNFYGNMYRGRYRGM**MEPMSRMTMDFQGRYMDSQGRM**VDPRYYDYYGRYNDYDRYYGRS
MFNYGWMMDGDRYNRYNRW**MDFPERYMDMSGYQMDMYGRWMDMQGRH**CNPYSQMMYNYNRHG
YYPNYSYGRHMFYPERW**MDMSNYSMDMYGRYMDRWGRY**CNPFYQFYNHWNRYGNYPGYYNYYYMYYP
ERY**FDMSNWQMDMQGRWMDMQGRY**CSPYWYNWYGRHMYYPYQNYYWYGRYDYPG**MDYSNWQMD
MQGRWMDMQGRYMDYPYNY**YNWY

Sequence 46 (reflectin 2D) [Euprymna Scolopes] US 7314735 ABZ24324:
MNRYMNRFRNFYGNMYRGRYRGM**MEPMSRMTMDFQGRYMDSQGRM**VDPRYYDYYGRFNDYDRYYGR
SMFNYGWMMDGDRYNRYNRW**MDFPERYMDMSGYQMDMYGRWMDMQGRH**CNPYSQWMMYNYN
RHGYYPNYSYGRHMFYPERW**MDMSNYSMDMYGRYMDRWGRY**CNPFYQFYNHWNRYGNYPGYYSYYYM
YYPERY**FDMSNWQMDMQGRWMDMQGRY**CSPYWYNWYGRHMYYPYQNYYWYGRYDYPG**MDYSNWQ
MDMQGRWMDMQGRYMDYPYNY**YNWNH

Reflectin 1 [Sepia officinalis] CCG28037:
MNRYMMRNRPMYGNMYRTGKKYRGV**MEPMSRMTMDFQGRYMDSQGRM**VDPRHNDYYGRWNDYDR
YYGRSMFNYGPHMDGHQHGGW**MDFPERWMDMSNYQMDMQGRWMDMQGRH**CQPFNQWGYNRH
GNYPSSYYGRN**MFYPERWMDMSNWQMDTQGRWMDMQGRY**GSPFNQWGYNRHGYYPGSSYGRNMY
HPERW**MDMSNYQMDMQGRWMDMHGRH**VNPFSHSMHGRNWSYPYYNYYSSRH**MDYPERNMDMSN
WQMDMQGRWMDMQGRHMDPSWSN**MHDNHNYWF

Reflectin A2 [Doryteuthis opalescens] KF661516:
MNRYMMRHRPMYSNMYRTGRKYRGV**MEPMSRMTMDFQGRYMDSQGRM**VDPRYYEYGRCHDYDRYNG
RSMFNNGPYMDGQRYGGW**MDFPERYMDMSGYQMDMHGRWMDSQGRY**CNPMGHSWSNRQGYYPGS
NYGRNMFNPERY**MDMSGYQMDMQGRWMDMGGRH**VNPFSHSMYGRNMFNPSYFSNRH**MDNPERYM
DMSGYQMDMQGRWMDTQGRYMDPSMSN**MYDNYNYWY

Figure S1 Name, origin, UniProt ID, and amino-acid sequence of all reflectin isoforms used in this study. Repeating motif regions are highlighted bold.

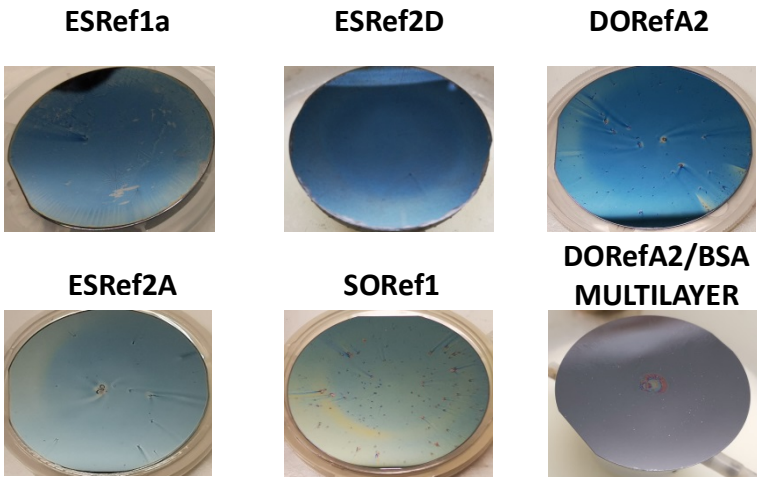

Figure S2 Optical images of reflectin thin-films following fabrication by spin coating 1% w/w reflectin in HFIP onto a clean Si wafer. Camera images were taken following drying. DORefA2/BSA multilayer films were fabricated by spin coating reflectin and BSA sequentially.

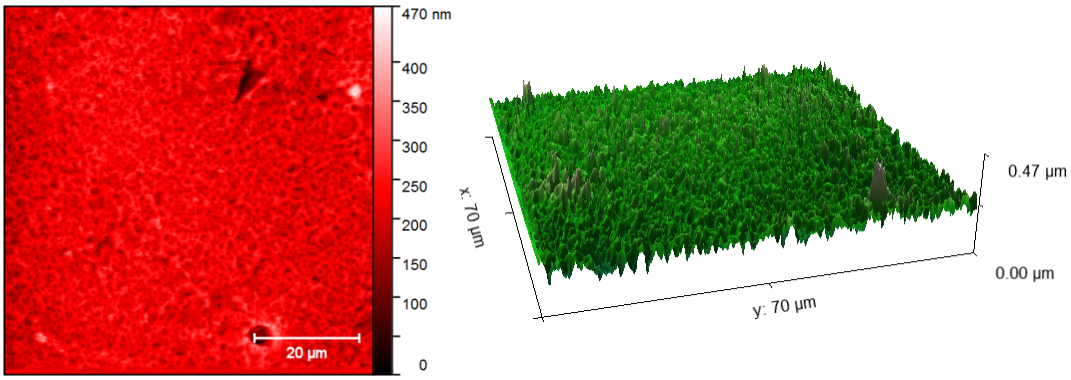

Figure S3 Representative atomic force microscopy (AFM) images of a DORefA2 thin-film fabricated by spin coating 1% w/w DORefA2 in HFIP onto a clean Si wafer. AFM data was processed using the Gwyddion software package, http://gwyddion.net/.

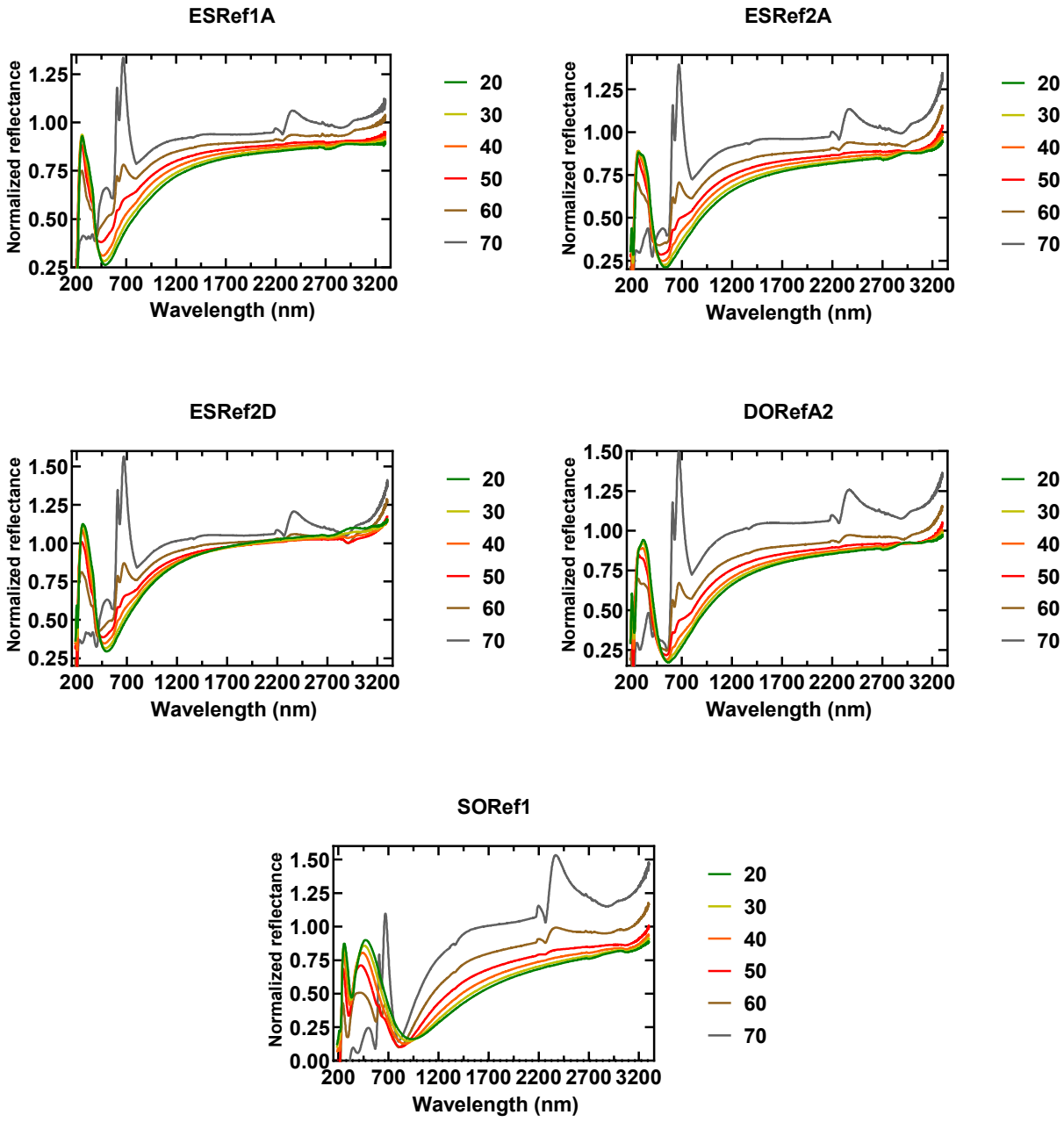

Figure S4 UV-Vis-NIR reflectance spectra (185-3300 nm) of reflectin-based single-layer films fabricated by spin coating 1% w/w re flectin in HFIP onto clean Si wafers. The angle of incidence was varied between 20-70 degrees (10 degree intervals).

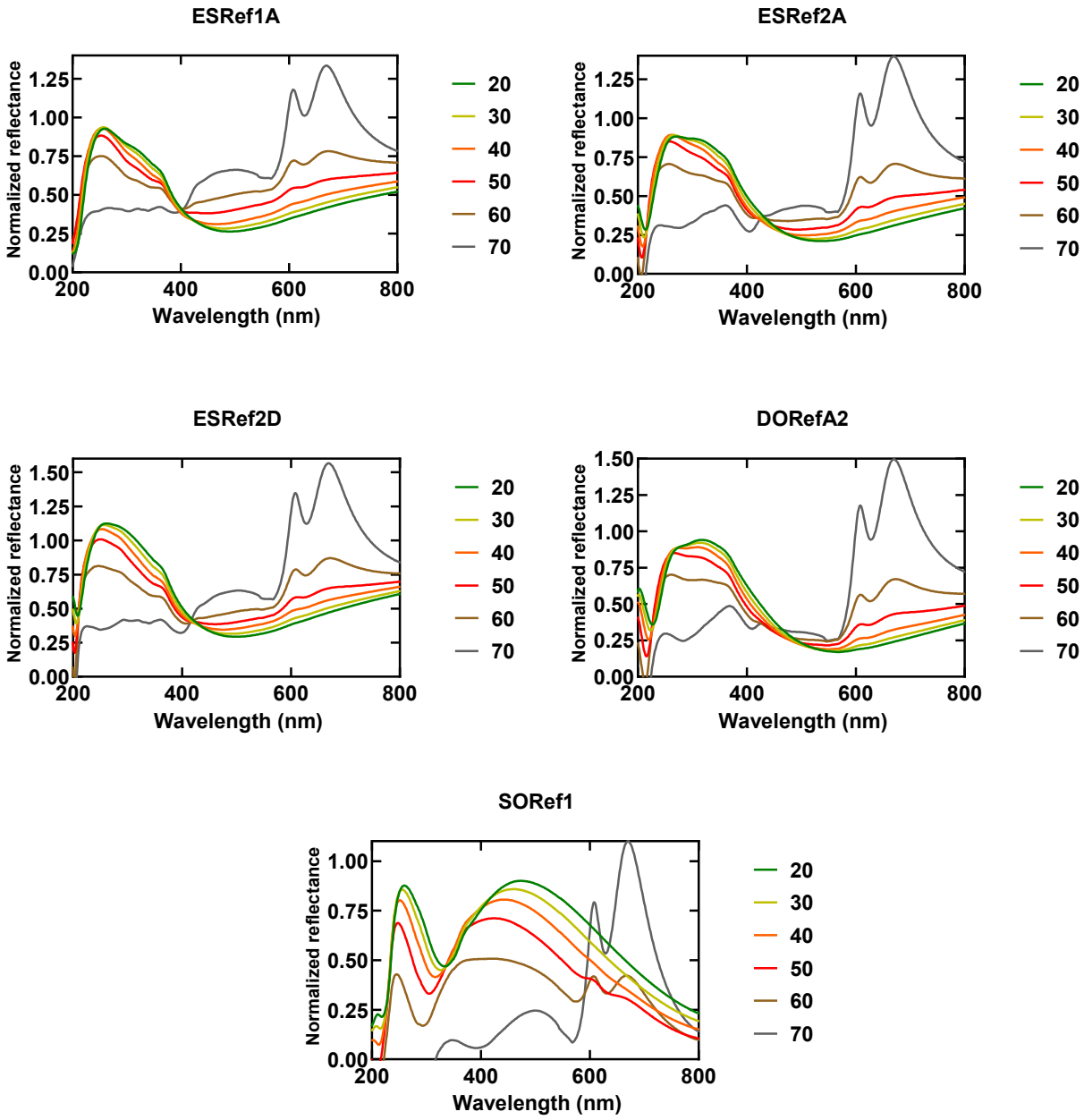

Figure S5 UV-Vis reflectance spectra (200-800 nm) of reflectin-based single-layer films fabricated by spin coating 1% w/w re flectin in HFIP onto clean Si wafers. The angle of incidence was varied between 20-70 degrees (10 degree intervals).

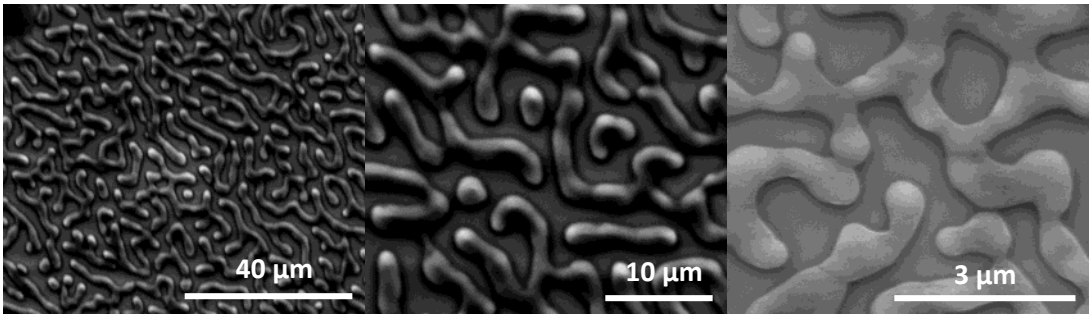

Figure S6 Representative SEM micrographs of the surface of a reflectin thin-film fabricated by sping coating 1% w/w reflectin in HFIP onto a clean Si wafer.

Agrobacterium fabrum PHY1:
MSSHTPKLDSCGAEPIHIPGAIQEHGALLVLSAREFSVVQASDNLANYIGVDLPIGAVATEA
NLPFISVLSAWYSGEESNFRYAWAEKKLDVSAHRSGTLVILEVEKAGVGESAEKLMGELTS
LAKYLNSAPSLEDALFRTAQLVSSISGHDRTLIYDFGLDWSGHVVAEAGSGALPSYLGLRF
PAGDIPPQARQLYTINRLRMIPDVDYKPVPIRPEVNAETGAVLDMSFSQLRSVSPVHLEYMR
NMGTAASMSVSIVVNGALWGLIACHHATPHSVSLAVREACDFAAQLLSMRIAMEQSSQD
ASRRVELGHIQARLLKGMAAAEKWVDGLLGGEGEREDLLKQVGADGAALVLGDDYELV
GNTPSREQVEELILWLGEREIADVFATDNLAGNYPTAAAYASVASGIIAMRVSELHGSWLI
WFRPEVIKTVRWGGDPHKTVQESGRIHPRKSFEIWKEQLRNTSFPWSEPELAAARELRGAII
GIVLRKTEEMADLTRELQRTNKELEAFSYSVSHDLRAPFRHIVGFAQLLRERSDALDEKSL
HYLQMISEAALGAGRLVDDLLNFSQLGRTQLTLKPVDMQKVVSEVRRSLSHAVSDRQIEW
RIGALPVIFGDPTLLRQVWYNLIENAIKYSSREPVSIITISAVETEDDVTYSVEDNGVGFDMA
YYNKLFGVFQRLQRVEDFEGTGIGLALVRRIVERHHGLVGAEGTVGEGATFSFTLPVTKVE
EEKIA

Figure S7 Amino acid sequence of phytochrome 1 from Agrobacterium fabrum used in this study.