Examining the Capacity of Human U1 snRNA Variants to Facilitate Pre-mRNA Splicing

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Supplemental Figures and Tables

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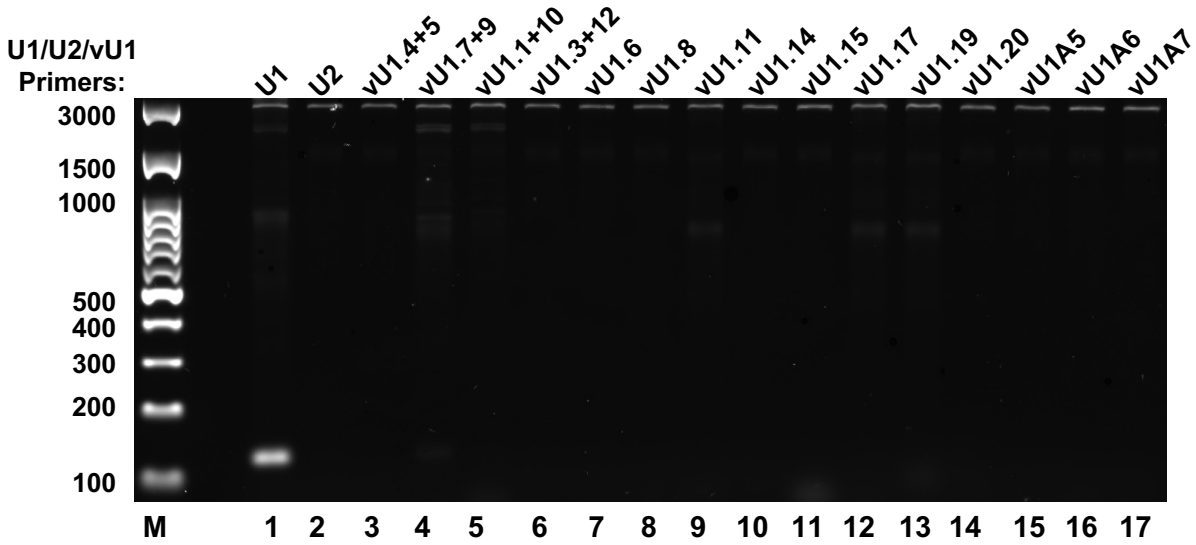

Figure S1. Variant specific primer pairs fail to amplify the canonical U1 snRNA. PCR reactions were performed using the plasmid pNS6U1-wildtype as a template and the products were separated on a 2% agarose gel. Sequences of primer pairs used for PCR are provided in Table S2.

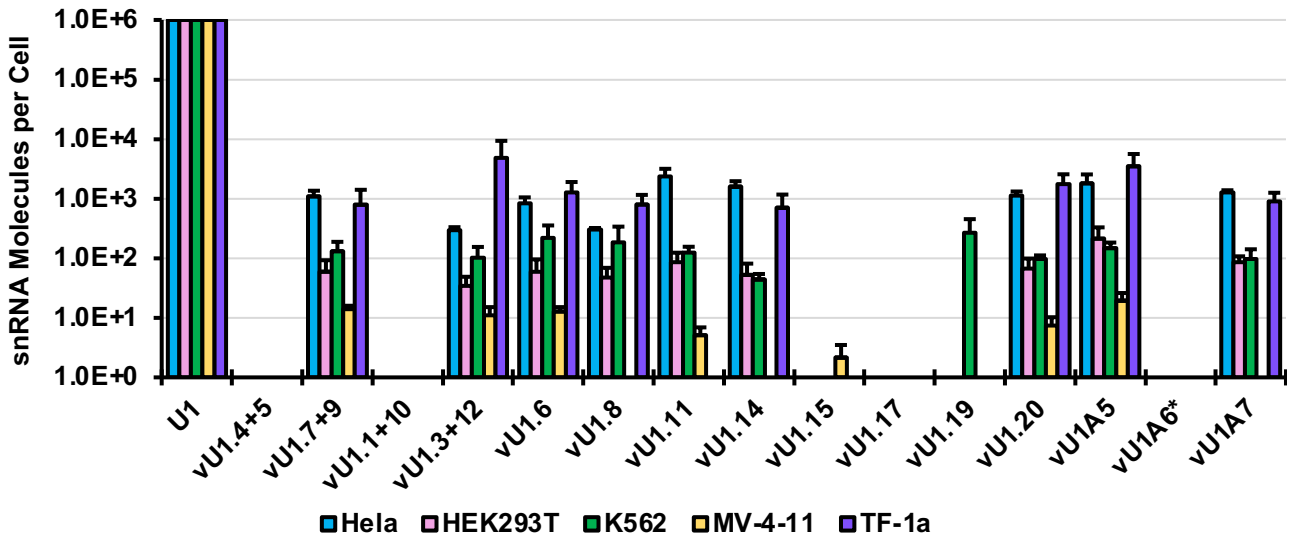

Figure S2. Variant U1 snRNAs are present at very low copy numbers in human cells. Copy numbers of vU1 snRNAs were calculated using the observed relative expression levels from Figure 1 and a value of one million U1 snRNAs per cell for human cells (Baserga & Steitz, 1993; Steitz et al., 1988).

Table S1: Variant U1 snRNAs nucleotide changes relative to the canonical U1 snRNA.

Name	Alternative names	Length (nts)	5'-region	Helix H	SL1	SL2	SL3	Sm site	SL4
vU1.4+5	vU1.4; vU1.5; RNU1-50; **RNVU1-4***; RNVU1-5; RNU1-102	164	A3G, C4U, C8U	C119U, G121A	G17A, G20A, A22G, C24U, C25U, C46U	G51A, G54A, U62G, **C64G, A65G, G68U, C69U**, C73G, C74U	C92U, A102G, A113U, C116U		G142A, **C147U**, U150C, **C151U, C153U, C155U**, C159U
vU1.7+9	vU1.7; vU1.9; RNU1-6; RNU1-9; RNU1-6P; RNU1-9P; RNVU1-7; RNVU1-9; RNU1-26P	164	-	-	-	-	-	-	U150C
vU1.1+10	U1.4; U1P14; vU1.1; vU1.10; RNVU1-1; RNU1-53; RNU1P10; RNU1-10P; RNVU1-10	164	-	-	C25G	C53A	G93C, A94G	-	U157G, C161U
vU1.3+12	vU1.3; vU1.12; **RNVU1-3***; RNU1-113; RNU1-151; RNVU1-12	161	C4U, C8U	G121A	G17A, G20A, A22G, C24U, C25U, C46U	G54A, U62G, **C64A, G68U, C69U**, C74U	C92U, U107A, A113U	-	G142A, **C151U, C153U**
vU1.6	vU1.6; RNVU1-6; RNU1-99	164	-	C122U	G17A, AC6C, **A29G,** C46U	G51A, G57U,G79C	G93A, A94G, C116U	-	G140U, G141A, **G148A**
vU1.8	vU1.8; RNVU1-8; RNU1-145	141	U2C, C4U, G11A	-	G17A, G20A, U22A, C24U, A26G, **A29U,** C31U, C47G	G56A, **Δ60-83,** G84A, C86U, C87U, C89G	G93A, U95C, A113G	-	G141A, **G154U,** C159U
vU1.11	U1.1; U1P1; U1P2A; vU1.2; RNVU1-2; RNU1P2; RNU1P6; vU1.11; RNU1-71; RNU1-12P; RNU1-13P; RNVU1-11	165	C4U, C9U	-	C24A, A26G, **U30C**	53::insU::54, C63U, **C69U**	-	-	A143G, **C147U,** U150C, **C153U,** C159U
vU1.14	vU1.14; RNVU1-14; RNU1-37	164	-	C13A, C119G	58::insU::59	G56A, **A70G, C71U**	A104G	-	G142A, **C146A,** C160U, C162U
vU1.15	vU1.15; vU1.16; **RNVU1-15***; RNU1-66; RNU1-121; RNVU1-16	165	C9U	A14G	C47U	**A65G G68A C69U A79G C71U,** A77G, G81A	G93C, 97::insU::98, A102C, G109A, A111G	U127C	161::insC::162
vU1.17	vU1.17; **RNVU1-17***; RNU1-127	164	U2C	-	C24G, C25U, C33U, **G37A,** C46U	G51A, C82A, C88U	A123G	-	161::insC::162
vU1.19	vU1.13; vU1.19; **RNVU1-19***; RNU1-126; RNU1-147; RNVU1-13	167	-	-	C25U, **G28U,** 32::insAA::33, 58::insU::59	C68G, **C69U, A70G, C71U,** C88U	U105C	-	C161U
vU1.20	vU1.20; RNVU1-20; RNU1-110	163	A3G, C4U, C8U	C119U G121A	G17A, G20A, A22G, C24U, C25U, C46U	G51A, G54A, U62G, **C64G, A65G, G68U, C69U**, C73G, C74U	C92U, A102G, A113U, C116U	-	G142A, **C147U**, U150C, **C151U, C153U, C155U**
U1A5	**hU1A5****; U1A5; RNVU1-33; RNU1-87P	172	A3G, C4G, U5C, U6C, C8G, C9U	-	Completely different sequence	C48U, G50C, G51C, G52U, C53U, Δ55, C74U	G93A, 97::insU::98, C100A, G109A, C116U	G130A	G141A, A143G, **C151U, G154A,** U157C
U1A6	**hU1A6**;** U21A6	171	A3G, C4U, U5C, A7U, C9G	A14G	U22G, C25G, A26C, 28::insUUG::29, **A29G,** A32C, C33U, 35::insUA::36, G**37A**, G41U, C47U	C48U, A49G, C53G, G54A, A55G, C58U, A61U, C63A, **A65U, C69U, A70G, C71U,** C73U, C74G, C82U, G84U, A85G, C87U, U90C	A102G, U107A, G109A, Δ110	U127C	**G148U, C151U,** C159U, 160::insUGU::161
U1A7	U1A7; RNVU1-34; **RNU1-85P*; hU1A7****	165	C8A	G15A C119U	G20A, C25A, C33U, G34U, 35::insA::36, U42A, C46U, C47U	C53U, C58U, A61G, **C64U, A65C, C71U,** C73G, C74U	C92U, A94G, 97::U::98, C99U, C100A, C116U, G116A		**G146A, C147U, C151G, C153U, G154U,** U157C

Table S2: List of DNA primers used for RT-qPCR assays.

Target	Forward oligo	Reverse oligo	Amplicon	Reference
RNU1-1	ATACTTACCTGGCAGGGGAGA	GCAGTCGAGTTTCCCACATT	122	Mabin et al, 2021
RNU2-1	TGGCTAAGATCAAGTGTAGTATCTG	GAGCAAGCTCCTATTCCATCTC	115	This study
vU1.4+5	ATGTTTATCTGGCAGAAGAAATGTTA	ATTATGTAATCAAGATTCCCACATTC	127	Mabin et al, 2021
vU1.7+9	CCAGGGCGAGGCTTATCC	CAGGGGAAAGCGCGGAC	118	This study
vU1.1+10	ATACCTGGCAGGGGAGATACG	GAGTTTCCCACATTTGGGGAAACG	112	This study
vU1.3+12	ATATTTATCTGGCAGAAGAAATGTTATG	AGATTCCCTCATTTGGGGAAATCA	115	Mabin et al, 2021
vU.6	TGGCAGGAGAGATACCCTGG	ACAGTCAAGTTTCCCACATTTG	113	This study
vU.8	AAGAAAAATCGTGTTTACGAAGG	GGGGGAAAAGAGCGAACGC	125	This study
vU.11	TGGCAGGGGAGATAACGTGAC	CAGTCGAGTTTCCCACATTTGG	113	This study
vU.14	GGTTTTTCTCAGGGCGAAGC	GCGAACGTAGTTCCCTACTATCAC	115	This study
vU.15	ATACTTACTTGGCGGGGGAGA	TTCCTCACATTGGGGGAAAATG	114	Mabin et al, 2021
vU.17	CAGGGGAGATAGTATGATCATGAAA	CGCAGTCGAGTTTCCCACAG	111	Mabin et al, 2021
vU.19	GCAGGGGAGATACTATTATCAAA	TTATGCAGTCGAGTTTCCCACG	119	Mabin et al, 2021
vU.20	TCCAGAGCAAGGCTTAGCAG	ACACAGACACAGTTCCCCACTG	110	This study
vU1A5	GATGAAGTTTGCTACCTTGGGC	GAGAGTGCAAACGCAGCCTC	130	This study
vU1A6	TCTTGGGGGAGGGTTTTTAC	AGGACAGAAAAGCGCAAAAG	121	This study
vU1A7	GGCAAGGGAAATAACATGATCATTA	GGGGAGAGAACCAACATAGTCC	153	Mabin et al, 2021