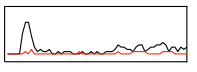
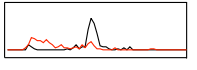
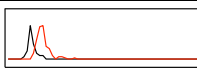
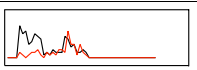
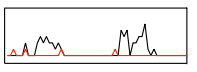
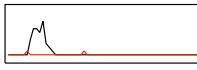
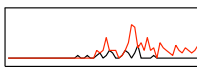
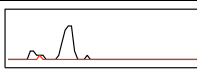
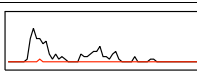
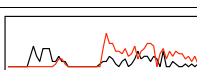
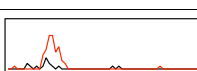
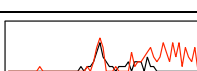
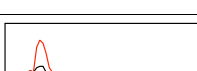
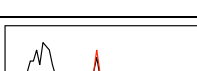
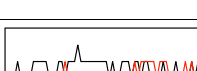


**Table S2: Top 15 unannotated RNA-associated proteins identified by DIF-FRAC**

	Gene Name	Protein	Function	Soluble without RNA? §	Disease links #	DIF-FRAC score/ p-value (5 % FDR)	DIF-FRAC plot
1.	BANF1	Barrier-to-autointegration factor	Chromatin organization	No	Progeria syndrome	6.17E-45	
2.	RCN1	Reticulocalbin-1	Calcium binding Secretory pathway Stress Response	No	Amyloid formation Hepatocellular carcinoma	4.97E-41	
3.	MAPIA	Microtubule-associated protein 1A	Microtubule assembly Structural protein	Yes	Hearing loss	1.38E-39	
4.	NOMO3	Nodal modulator 3	Carbohydrate binding	Yes	N/A	2.29E-32	
5.	ACTA2	Actin, aortic smooth muscle	Muscle protein	No	Vascular diseases	7.11E-31	
6.	RSBN1L	Round spermatid basic protein 1-like protein	N/A	No	N/A	1.45E-27	
7.	NIPSNAP1	Protein NipSnap homolog 1	Neurotransmitter binding	Yes	N/A	1.92E-24	
8.	CLSPN	Claspin	DNA binding DNA replication	No	N/A	2.79E-22	
9.	U2AF1L5	Splicing factor U2AF 35 kDa subunit-like protein	RNA binding (by similarity)	No	N/A	3.76E-22	
10.	MORF4L2	Mortality factor 4-like protein 2	Chromatin regulator	Yes	N/A	9.82E-22	
11.	HMMR	Hyaluronan mediated motility receptor	Hyaluronic acid binding	Yes	Breast cancer	2.04E-17	
12.	PTGES2	Prostaglandin E synthase 2	Isomerase	Yes	Type 2 diabetes	2.52E-17	
13.	WNK2	Serine/threonine-protein kinase WNK2	Serine/threonine-protein kinase	Yes	N/A	4.14E-17	
14.	MARK3	MAP/microtubule affinity-regulating kinase 3	Serine/threonine-protein kinase	Yes	Pancreas carcinogenesis	1.40E-16	
15.	ALOX5	Arachidonate 5-lipoxygenase	Leukotriene biosynthesis	Yes	Asthma	1.21E-15	

§ Insolubility in the absence of RNA is inferred by an increase in elution volume/ molecular weight of the protein upon RNA digestion, or a complete disappearance of signal. This is consistent with the RNA-associated protein being solubilized by RNA, as suggested by Maharana et al. (Maharana et al., 2018)

# Annotations from UniProt (The UniProt, 2017) and/ or OMIM (<https://omim.org/>)