

Supporting Information S1. The benchmark dataset used for studying human ORI (origin of replication). It consists of a positive dataset and a negative dataset. The former contains 283 experiment-confirmed human ORI sequences; while the later 282 human non-ORI sequences. Each of these sequences is 300-bp long. None of the sequences included has $\geq 75\%$ pairwise sequence identity with any other.

I. List of the 283 human ORI in the positive subset

>ORI-1

GTAAACTTGTGGAGGGGTGCGGGACGTGAGTTCTTCCCATGCCAGGCGAATGGTGTGGCCTTGAGC
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>ORI-2

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>ORI-3

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>ORI-4

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>ORI-5

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>ORI-6

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>ORI-7

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>ORI-8

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>ORI-9

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>ORI-10

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>ORI-11

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>ORI-12

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>ORI-13

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>ORI-14

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>ORI-15

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>ORI-16

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>ORI-17

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>ORI-18

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>ORI-19

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>ORI-20

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>ORI-21

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>ORI-22

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>ORI-23

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>ORI-24

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>ORI-25

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>ORI-26

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>ORI-27

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>ORI-28

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>ORI-29

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>ORI-30

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>ORI-31

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>ORI-32

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>ORI-33

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>ORI-34

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>ORI-35

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>ORI-36

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>ORI-37

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>ORI-38

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>ORI-39

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>ORI-40

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>ORI-41

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>ORI-42

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>ORI-43

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>ORI-44

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>ORI-45

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>ORI-46

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>ORI-47

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>ORI-48

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>ORI-49

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>ORI-50

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>ORI-51

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>ORI-52

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>ORI-53

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>ORI-54

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>ORI-55

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>ORI-56

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>ORI-57

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>ORI-58

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>ORI-59

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>ORI-60

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>ORI-61

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>ORI-62

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>ORI-63

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>ORI-64

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>ORI-65

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>ORI-66

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>ORI-67

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>ORI-68

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>ORI-69

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>ORI-70

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>ORI-71

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>ORI-72

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>ORI-73

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>ORI-74

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>ORI-75

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>ORI-76

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>ORI-77

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>ORI-78

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>ORI-79

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>ORI-80

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>ORI-88

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>ORI-89

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>ORI-90

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>ORI-91

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>ORI-92

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>ORI-93

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>ORI-94

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>ORI-95

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>ORI-96

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>ORI-97

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>ORI-98

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>ORI-99

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>ORI-100

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>ORI-101

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>ORI-102

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>ORI-103

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>ORI-104

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>ORI-105

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>ORI-106

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>ORI-107

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>ORI-108

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>ORI-109

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>ORI-110

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>ORI-111

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>ORI-112

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>ORI-113

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>ORI-114

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>ORI-115

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>ORI-116

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>ORI-117

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>ORI-118

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>ORI-119

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>ORI-120

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>ORI-121

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>ORI-122

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>ORI-123

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>ORI-124

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>ORI-125

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>ORI-126

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>ORI-127

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>ORI-128

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>ORI-129

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>ORI-130

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>ORI-131

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>ORI-132

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>ORI-133

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>ORI-134

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>ORI-135

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>ORI-136

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>ORI-137

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>ORI-138

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>ORI-139

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>ORI-140

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>ORI-141

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>ORI-142

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>ORI-143

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>ORI-144

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>ORI-145

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>ORI-146

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>ORI-147

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>ORI-148

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>ORI-149

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>ORI-150

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>ORI-151

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>ORI-152

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>ORI-153

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>ORI-154

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>ORI-155

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>ORI-156

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>ORI-157

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>ORI-158

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>ORI-159

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>ORI-160

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>ORI-161

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>ORI-162

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>ORI-163

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>ORI-164

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>ORI-165

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>ORI-166

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>ORI-167

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>ORI-168

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>ORI-169

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>ORI-170

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>ORI-171

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>ORI-172

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>ORI-173

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>ORI-174

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>ORI-175

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>ORI-176

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>ORI-177

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>ORI-178

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>ORI-179

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>ORI-180

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>ORI-181

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>ORI-182

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>ORI-183

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>ORI-184

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>ORI-185

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>ORI-186

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>ORI-187

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>ORI-188

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>ORI-189

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>ORI-190

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>ORI-191

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>ORI-192

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>ORI-193

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>ORI-194

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>ORI-195

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>ORI-196

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>ORI-197

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>ORI-198

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>ORI-199

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>ORI-200

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>ORI-201

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>ORI-202

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>ORI-203

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>ORI-204

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>ORI-205

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>ORI-206

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>ORI-207

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>ORI-208

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>ORI-209

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>ORI-210

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>ORI-211

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>ORI-212

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>ORI-220

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>ORI-221

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>ORI-222

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>ORI-223

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>ORI-224

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>ORI-225

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>ORI-226

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>ORI-227

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>ORI-228

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>ORI-229

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>ORI-230

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>ORI-231

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>ORI-232

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>ORI-233

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>ORI-234

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>ORI-235

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>ORI-236

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>ORI-237

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>ORI-238

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>ORI-239

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>ORI-240

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>ORI-241

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>ORI-242

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>ORI-243

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>ORI-244

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>ORI-245

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>ORI-246

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>ORI-247

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>ORI-248

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>ORI-249

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>ORI-250

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>ORI-251

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>ORI-252

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>ORI-253

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>ORI-254

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>ORI-255

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>ORI-256

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>ORI-257

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>ORI-258

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>ORI-259

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>ORI-260

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>ORI-261

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>ORI-262

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>ORI-263

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>ORI-264

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>ORI-265

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>ORI-266

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>ORI-267

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>ORI-268

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>ORI-269

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>ORI-270

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>ORI-271

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>ORI-272

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>ORI-273

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>ORI-274

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>ORI-275

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>ORI-276

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>ORI-277

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>ORI-278

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>ORI-279

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>ORI-280

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>ORI-281

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>ORI-282

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>ORI-283

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II. List of 282 human non-ORI sequences in the negative subset

>non-ORI-1

GAAAGATGGGTGGGGGGTACTGTAAGTGTGGGGGAGTATTGCATAATAGAAAAATGGACTGGA
AGAATGCTTACGCTGTATCAGGAGATTGGAATTTGGAGAATGGAGCCAGTTAATGTAGAGAGCTCAGC
GTATTAATAGTTAAAAACGAATGAAGATTGAGGGAGGGCTGAGGAGGCTCACAAGAAAAGCAGTAGATT
GTGTGTAGGGGAGAAAGTGTGTGTATGTGTGTCGGGTGGGGGGCGGGAGGTGAGTCAGAAAAGTGG
CGCTTCCATCAGAAGTGTCTGGTGT

>non-ORI-2

AAATAAATAAATAAAGGAAAACATTTTTGTAATGAAAAAGAATAATTAGCTTCAGAAGCTATATCTAAA
TTTTGGTGAGAAAAATGAGACTTCAAAGAAAATATCCCAATTTACTTGCCAAGAGTTTCAAAGGAAGT

GTTGGGAGGCTCCCCACTTTCCACTCAAGGCTTAGACCCAGTCAAGAGGGAGACTTCATGACACAGGCC
 AGGTGGTGAGGCCAGTGGCACCAACAAGTGCATTGGAACAAAGAACAAAATGGCACTCACTCTTTCTC
 AAGAGACTCGGCCAAG

>non-ORI-3

GCTTGGGTTTTAGGAGCCGCCTTTTCTTATTGATCATTCTCTTTTGTATCATAATCTCTTGGCCTCAGAC
 TGAGTTAAGGGAGCCATAGTAGGAGTGCAGAAAATGAAGTGGAGGAAAAAAAAATGTGATATTTAAAAT
 ATAGTTTTCTACTTTCTTTTCTCTCAAATTAATTTAGATGTAATAACATTTTAACAGGGCCCAACAT
 CAGGCTCCTAGGCTCTGGCTGCTGGTCTCACTTGACACCAGAATAAGATTTTGGTGTGCTAGTAATTTTGC
 CAAATGGAGGCCTA

>non-ORI-4

GGTGCCAGGCGAGGGGCACCTGGGGCGAAGGCTGTTCCAGCGCATGAAAGCGTTTCAGCGCCAGATGT
 CTCTGGAGGTCAGACGCCAGCCCTAGGGGCAGAATTTCTTGGAGACAGCGGTGGCGCGGGGAAGGA
 GTTAGTTCCAGCTGAGTCGGGAAGTCTGCTGCCTGAGGTGCAGACTCGCCAGGGGAGGGCATCTGCAG
 GTGCTGCTCGCTGAGGGTCTTCTGCTGCTGCGGTCTCAGCTGGCCGTTGTCAGCACCTGGTGGCTT
 TGAGATGACTCTGAGGTGTGGGA

>non-ORI-5

GGGAGGGCAGGCCATACAGCCTGTTGCTCTGTGGTGGCCTGGTCTGGGGAGGAAGCTGGTGTGATG
 TCAGATCTTCCAGCTCTGACTCACCGTGAGCTTGGCTCAGGGTGGAGCCCCACCAAGAGATACCATTTGG
 GAGGCCGCCATCTCCAGGGAGTTCATTTCCATGGGGTAATAACCTAAAGAAAAGGCTTTCACAGTTTTA
 GAGCAAGGGCAAGCAAGAGCTGGTGGAGCATCTGCTGTTGCTGTGTGTCATTCCACAGATTAGTGCAGT
 GGATATGTTATGCCTTCGTTT

>non-ORI-6

CAGGCTTTAAGTTGCTTGGGCAGGATGCAGCAAATTGTCAGTGAAGAATAGCCATGCCTGGATACACAA
 AATGCTTAAACTTTAAGTGTGGTTTTGCATCAAATTCACCTACGTTTACTTTCAAAGTTTGTAGGCCAA
 TGTACCTAGATCTAATATGCCATTTAATTAATTTATCTCAAACCTACACCCACCTCTAATATGATCATCAAT
 TGCAAAGATAGATCTTTTATCCATTGGTAAAAGACACATATGTTTGTGTTCTGCAGCCATATCCAAAGAGG
 GAAAAGCAGAGACT

>non-ORI-7

AGGTGTAGGCTAAGTATTAGCATAATGTGTGCATCAGAGTGGCCACTAGGTGGCAGATGTGACAGTCAA
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 TCTTATTTTCTTCTTTGTTACTTTCTTTTTTATATTGAGATTGGATCTCACTCTGTGAGTACATTGGAGTG
 CAGTGGCTCAATCATGGCTCACTGCAGCCTCGATCTCCAGGTTCTGAGTAGCTGGGACCATAGGTGTG
 CACCACCATGCTTGG

>non-ORI-8

AGCGCACATAGCAATTGAAAAGTAAAAGCTTATCAGACCCTTTCTGAAAATCAGCCCACTGTTTATAAACT
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 AGGGTAGCTCGCCATAGACATACATGGCAGGCAGGCTTTGGCCAGGATCCCTCCGCTGCCAGGCGTC
 TCCCTGCCCTCCCTTCTGCCTAGAGACCCCAACCTCAAGCCTGGCTGGTCTTTGCCTGAGACCCAAACCT
 CTTGACTTCAAGAGAAT

>non-ORI-9

TGGTTAGAGCAGGGCTAGCGGTGGGCAGGGGAGAGGGCCAGGGCTGGGCCACGGCCAGGGGGAGGCT
 CCCTTGGCTTATCTTGGCCTTACCGGTGTTCTGTGCCCTGGACTTGCCTTCCCTTCTGCCTTTCTTT
 ACCAGGCCCCAGCCAGAGCCTGGAGTTGCTATGGCAACTTCGGAGGAACCCATTTCTTAGTGATGTCTA
 TGGTACAGAGACTGGCCTGGAGCTCAGAGCTGCCGGCAAGAGGCCTCCTCTGCTGTCTCAATTTCTCTCC

AGGCCTCACCCACTTCCC

>non-ORI-10

AGCCTGGGGGAGGGAGGAGGGGCTCCCTGGGGGCGTGGGAGGGTCTGGAAGGCCTTAGGAGGGCGG
AGCCCGGCAGAGGCGTGGTTAGGAGGAGGAAAGGGGCTGCAGAGGACTGACTAGCTGAGGGGTGCA
GGGCTTTCTGTGGGAGATAAGGGAGGAGCTGACTCTGGGTCCTGGTGAGAGATGCGCTGCCAGAGTAG
GAGATGAGGCCCTGGCCCCAAGGTAGAGATGAGGCCAGGCCAGGCTGAAGGTGAGACCCCACTCTGCA
GGACGAGGTGCTGCTGACCGAGAGCAGC

>non-ORI-11

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GTCACCAGTACGTGCGCAGTGAGTCAGGTAATAAGAGGCCTGCTGGGTGAGGACCCTCCTCCCCTCTGC
CCTCCCCTACCCCATCAGGGAGCAGTCATGGCTGGTGAGAGGTGGGCCACCTTGACAAACCTAGTGGAA
GGGTCTGCTCAGACAACCTAT

>non-ORI-12

GGGTTTGGTTGGGGTGTGAGATCTGAGCTTGATTTCTCTGCTGGGATTTGAGATGTGTGGGATTTGTGAG
GTGTTGGGTCCAGGCAGAGACTATATTGAGCTTTGGGTTTACATCTTGGGAGAGGGCTAAGTGTGCTAT
TTGGGTTTTGGGGCTTGGTTGGGGTAGGAGATCTGAGCTTGATTTCTCTGTTGGAATTTGAAGTTTAGGT
AGCAGTCACCATTATGCTCAAAGCGGTGATCCTGATTGGAGGCCCTCAAAGGGTGAGGTGCCAGGGGA
ATGGGGGGAGGAGGTTGGGCT

>non-ORI-13

CAGCCATTATCGGGGGAGCAGATTGCAGCCCCCTCCCCTCTCTGGGAAGCAGGCACAGCTGGGGCCCCA
CCACATCTGCTGCATCCGCACGGAGCACAGCTGGGTGTGCCAGAGCTGCACTCCCCAAAACACAAAGGG
GGTGGAAAGGGGTGGGTGGGGGCCAAGGAGAGCCCAGACCCCTGAGACAGACACACTGACACCTCTGC
CAACAGACACATACTCTTTGAGGCGAAGCTACACCCACTGACACACGCTCCCTCGTGTGCAGAGACGGGA
GAACTGGCAAACATGCAATTAC

>non-ORI-14

GGGTGTGCATGCAGCTAATTGCTGCTCCACTTCTGGCAGCCTGGAGCTCCCCTCACAGCACCCCCGCAT
GCCCTTATACCCAGTTACCACCCGATTTCTTCTTATAGAGTTGAAGGCATCCTGCCTACCCTCAGGAG
GAAAGAGGATGTGATTTGTCTCATGATGGAGGCCAGTATGTTGTCGGGGAAGTGTGACCCCAAGATCTC
AATAGATGGTGGGTGAATTTAGAGATATGTATGCACTCCAGGGTAGCAACGAGTGCTGCGGAGAGTTG
GGGGGCAGTTTCCCGCTT

>non-ORI-15

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GCTCCCTCTTCCCAACAACCTCTTCTACAGCCCAGCCCCAGGGCCCAGAGGCAGGGCTGGCGTCAGGC
AGACTGTACTGCATAAATACGTGGAGGCCACAGCCGAATCAGCAGCGTCAGGGGGCAGGGAAACTGG
GTTTGGGATGAGAAGTGGGTGGCTCTGGGGGCACGTCCCCAGTGCTTGTCCAGAGCCCAGGGACCCAC
AGAGCCAGAGAGGGGACCAGTGGG

>non-ORI-16

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ATATAATGCAAATCTTAGCACAGTGCCAGGCACATCCGCTCAAGGAATATTAGCTGTTTCTGTCTGGGGCA
TTATTATCGTTGGTGTACTGAAGTGGGCTTGGCTGGGGCTGGGATCTGACCTTCTCCAGGTAACATC
AGCCAAAGCTTGGGAAAGCTCGCACTCGAACGTAGCTGTGTGCGCCTCGGTCACCTCTAGGTCGTGTGGC
CCCCGCACGATGGTCAC

>non-ORI-17

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GTGTTTGTGTGAACTCCCTGTGAAGAGACTGGTGTGGGGAGCCTGAGCATGGGCTGGAGTTTGTG
TGGCTGTGGCCATTCTGTCTGGCCATGGCTGGGTGGGAGAGGGTGAAGATGATTACGACAGGGCAGAAT
ATGTGCAGAAGGCCTCTTAGGCAT

>non-ORI-18

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CACAGACATCTGCGTCAGAGATAGGAGGTCTCAATGCCACGGGCAGGGGCAACTCGGACTGTGGGGCGT
GGAAAGGACTGGGGAAGACTGGATGAGAAGGGTAGAAGAGGGTGGGTGTGGGATGGGGAGGGGAGA
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>non-ORI-19

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GGATTTGTTCTACGAATGTGGCCACACAGCAAACAATATTTTAACTTAATTTTAAAATTATTTTACTTC
AATAGGTTTTGGGGAACAGG

>non-ORI-20

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GGATGCAGGATTCTGTAGAGATAGATGGACAAATATGTAGTTATAAGCCTTAATGGTCACATAAATACAC
AATCAGGTATAGAACCTGGATAGGGAGTTATGGACTACACTCTGGCTTGACCTTTAGTAACTGATCACTTG
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TACAGGTCCATAGAGTCA

>non-ORI-21

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GGTCTTCTCAAAGAGCCACCTAAGGGGAGAGTTGAGGGCATTCCCCAACTGGCGCCACACTGCCGCTG
ACCCACAAGCCAGAGGCAAATTCCCGCACCTCGCCCTTCTCACAGCTTGTGCAGTCCGCTAAAGCAGAA
GCTCCCCAGGCGTCCAGCTTTAAGACAGTGTAAGAAAAACAGGTGCCACTGGTCTAGTCACATCCCCT
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>non-ORI-22

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CCGAATCCTCCTGCTAACCTCAAAGCTCAATCAGAGGCTGGATATAAGGCCAACTACACCACATAGGC
ATAACTCTGAAGCCCCGTGGACTCAATGCTCAACCATAGTCTACACATCTGATTTCAATTCTAAGCCAAA
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GTGTGAATTTGAAG

>non-ORI-23

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GCTCCCTCTGTCCAATGCAGCTCAATCCAGTGAGCAGTTATTGTACCTGCTGCCATCAGGAGCTCTGCTG
GGTTTGTCTTGCCTCAGAAAATTCTGCTATTGCTAACAATTGTGTTGTGATGGCATTCTATGCCTTTT
GTAAGAATGGACTCACGCACAGGCTATTTTTGGATTGAGGGGTGGCTGGGGGTGGAAGCAGGACAGTT
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>non-ORI-24

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TGAGGAAGGACAACGTGCTGTGAGTAATCCAGGGGCTGCGGGAGGAAGGGTGGGGGTCTGGCTGAC

CCCTACCTATTCTGTCTGCTTTCATTGTGGGTGATGCTGGCTATGGGGGGATGCTTACTAAGTATCTCTTCT
TGTTATTTTAAAGAACGATCTTTGAGTGGGCCACTTTTAACTCAGCAATCCTGGGTATGAAAGCAACAGTA
TGGGAAGCACCTGTGCTTAGG

>non-ORI-25

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CTTGTGAGCCAGGGAAGTTAGCAATAGCACGGTTAGGTTCTGCTGTAGTGTGTGAGGATGGCGGGCTA
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CTCTACTTGAGGCCATGAAAGC

>non-ORI-26

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AATATTTAGGACCCCTATATAAAATTATCTTCTCCAAAGTCATAATTTCCAAGAAGATCTTATACCCACT
ATTTTCATAAGTAGTCAACTGCAAGATCTTTAGAACCATGAGGGATCTCAATACACAACAATTTAAGATT
AACCATTTTGTGAATGTAAGATTATATCCCTCCAAAGAATGAAATTTAAATAGAGAAAAATAAACAGCA
CACGTGGAATCCTGA

>non-ORI-27

CCTGAAGTTGAGGCTGACTAAAGTGTGTCGTCAGGATTTAAAGGTGTGACATGTTAGGAACTGAAAGTTTGT
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ACTTGAGTGATGGAGACTTGGCACTCAAACAGCTAATAAGAAGTCATGTAGATTGTTAAGAAATGGAGG
GCATGTGGAGATTGGCACTTGAGGGCTAATCATGGGTAATTTGCCACCTCTTTGAGTCTCAGTTTCTC
ATCCACGTGGGCAGTGGTG

>non-ORI-28

TCTTAGGTCTTGTAAATGTACGGTTTTGGGGGTGGGGTAGGAGATGGACCTCAGCCCTGCATCCAAA
GTTGATTAATAATCCTGAAATTTTTATAATTGGACCTCATAATAAATTCCTCAGGGTCCAGGAGGCTCTG
TAGAGGTAAAACAAGGTTTGGAGAGATGAGAGCAACAGGAGTTGGAAGATCCCAGACCACAGAGTT
AATTCACCTAATCAGCCTGGAGAACTCCACATTTACAACACATCCGAGGACTCAATGAGGCCTCCCACC
CTCTGCAGCACGGCAGGGA

>non-ORI-29

CATACCTCATGCCAAGATGAACTGAGATCGAAAGTGACAAGACCTACCTGAACCACCTTAACCAGATACT
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ATGATCCAGGGAGCAAGCAGATTCCCTTGTACTATTTAGCTTATAACCAAATCTCTAACTCTTTAATTATT
TTCTTGATGCATTTATTACAAGAGAGCTTTAGTTCAAAGGTAGCAGAGCTTGAAAGTTAGATTTGTACAAA
AATTTAAAAGCAGC

>non-ORI-30

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ACCTCCCTCTTCTTCCCCTCACAGCCCTATCTCAAATCACTTCCCAGCAATGACTTGCCCTTCTCCCTCCAG
GGCTGTCCCTGCATTCCCACACCCCTCCCGCTGGCACCTCTGCCAGGCTGTGGTTTGGCCCCGGAGGTC
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ACGAGTCATTGAGCAG

>non-ORI-31

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CATGTGACTTTATACATATAGTGTGTGGCTTCTGTAGCCAGACCCTTGGGAGGCCCTAAACATTGAAAAG
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AAATCAATAGAG

>non-ORI-32

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 TCGGTAACGCCTGTCAAAGCCGTGCGGCGGGAGGCTGCACACTCGCGGAGGCTTGCAGTCTTTTAGGAA
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 TCACTTGAGTGACTTCTGTTTGA

>non-ORI-33

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 GTGCAGTAGCTCGCGGTTAAGAACGGGCAGAACGCCACTCAAAAAGCACGTGGGATGGTGGGTTTCGG
 ATTGGGGTGAGTCCCAGCGGCGTTATTAAGGGCGCACCAAGTATCAGCTCAACACCGTGCTCACCAAAGA
 GGCCGACCGGGCCTCCCTGA

>non-ORI-34

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 ACCCTCCCACGACAGAGGCTCTCGTAAACATCCCTCTCAGGCAGGTAGTCCACAGGCCTCTCATAGATGC
 CTTCTGGGGTTGCTAGCTCAGCTTCTGTCTGATTTGTTAACGTTTTTTCTCTCTTCTCCAATAACTGCTC
 AAAGTACCGCAGATT

>non-ORI-35

GGACCAGATCCCCTGTGTATCCGAGGCTTGAAGGCGGAGGGTTGGCCTGGGCGCCCCGCATGCTGTAG
 AGGCGGCTTCCAGGCAGAGGCAGGCAGCCCCAGCCGCCCTCCTCCCACGCTGGCCTGTCTGCCGATCC
 CGCGAAGAATCTCCCAAGAGTTCACGCACCCGCCTCCCGCTGGCCTCATCTGGGGGAGCCACTGTGGAC
 CCGGGAAGGACCCGCGGAGATGGGCCAGGGTCTAGACAGCTCTACAGAGGCCAGAACTCTTCAGAC
 TCACCCCTGCCTGAAGATCTG

>non-ORI-36

GTTTGCCTTGGGCCTTTCATGCCCCGGCTGCACACATCGTCTGTGAATTGTGGCTGTTCACTCCCGAGGAT
 GTGTCCTAGACTCCGGGTCGCGTGGATCTACCCTCTAGTTTACTTGCTCGGGAGAAGAACTGACTCGTTT
 TATTTAGTGCCTATTTAGCGAGCCCAGAGTAACGTACATTTGTGCTGTTTTCAATTTGTGCTATCGCAAAT
 CACAAAAAACTGTTATCAATTCACATTCATCAGCACGAGACCCATTTCTTGTGCTCCTGCCAGCTCA
 GGATATTATGTTTC

>non-ORI-37

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 ATTTTGGCCACAGAACTTTCATTAAAGTAGGATAATTTAAGTCTAGTAAATGAAATACACCCTAAGTGGCT
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 CCTTGAAGGCCAG

>non-ORI-38

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 CAGATTACTTGAGGTCAGGAGTTAAAGACCAGCCTGGGCAACATGGTGAAACCTGTCTCCACTAAAAAT
 ACAAAAATTAGCTGGGCATGGTGGTGGGCACCTCTAATTCCAGCTACTCAGGAGGCTGAGGCACAAGAA
 TTGCATGAACCTGGGAGGCAGAGGTTGCAGTGAGCTGAGATCGTGCCATTGCACTCCAGCCTGGGGGCG
 ACAAGAGCAATACTCCATCTCA

>non-ORI-39

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CCGGAAAAGCCCCACCTGAATGCACCTGCCAGGCCTCTCCGGATGGTGTTCATGCTGAGGGTGGGGGT
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>non-ORI-40

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GCCCTGCCTATCCAGAAAGATGGAACCCCTTCCAGTCAAATTCACGTGACTCCCTCAAGAACAAAGACT
GGAATTGAGGCTGATGTGGG

>non-ORI-41

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CTTCTTTGATTGAGGCTCATTTGCATTCAATGGCTAATGTGAGTTGTAGTCTGCCACAGGATATGGGTAGT
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GGACACATGCAGACTCTA

>non-ORI-42

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>non-ORI-43

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TGCCAAAGATGGTCTCAATCTCTTGACCTCGTGATCTGCCTGCCTCAGCCTCCAAAGTGCTGAGATTACA
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>non-ORI-44

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CAGATGGTTCCTGGGTAACAGGATGTCCTCTGTCTTGTACTCAAGAACAAACTGCGTCTTTGAAAACA
CTAAAGTCATAACACAAGATC

>non-ORI-45

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TTATTCAGTTGAATACTAGGATTTCTGGATAACACTTTGGAGACATACATATTACAAAAGGAGAAGAGTTT
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AATGTTGAATGCTTTG

>non-ORI-46

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ACAGATAGAAACC

>non-ORI-47

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GGCCTCGATTTACGCTGCCATCTTT

>non-ORI-48

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ACTCTGCCAGTTCTTTTTCTGCCTTCTCCTCAAAGAAAGGTTCAGTAGCGGTAATGTAAGAACATAAAA
GGAAGTAGTACTTTCA

>non-ORI-49

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TTGCCTCTGCAATTTTATTA

>non-ORI-50

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TACATAATAAGTAATGTTAACAGGTTAAAAAAAATCATTTAGGGACTGAAAATCTGAAGACCACAATG
TAAAATAAAGCAAATGTGT

>non-ORI-51

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AATAAATGGCCTACTCC

>non-ORI-52

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ACTGAGGATCCCTGGGGCCAGCGTGAGTGGGAGTGGAGGAAGGAGTCCAGGAAATCCCTGGAGATCCG
CAGCCTGGGATGGCCCTGTTGAG

>non-ORI-53

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AACCGGCTTCTCACCTTCCCTGCTGCCAGTCCAGAACCGAATAGGGCCTCACACAAGTTTTGTGGATT
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TTCTTCCTGGCTGGTT

>non-ORI-54

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AATGGATGTGATCATTAAATTAGGCTTAGGCGTAGGTGCCACAACAGGTCCGGAGAAGTCATAATTTAAC
TACAGCTTTAAATTACACAGGCAGAGTGGGGATGGCAGAGTTTGACGGCAGGAGAGCCTGCCTCGGAGC
TCGGGGAAACAATTAGATAAAC

>non-ORI-55

TTTCTTTCTTCATTAATGGCCTTTTTCCCTATCCGAGAGCCTGGGCGCGGGAGGGAGCGAAGACGGCCG
GGGGCAGGGCAGGCCCTCCGCAAGTGACACTTAATCCCGGTCTGGACTGGGCCGGCGCTTGAAAGCAA
CTAAATTAGCAAAACAGAAGTCAACTGTGATTGCTTCATTGGAGGATTAAGTGTGATAAATGGGGGGTT
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>non-ORI-56

AACACACACGTACACACACATCTCATAATCACTGTAAGTGTGAGCATAGAAGCTGCTGAAATTCTAAGCT
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ATGACCGTATTTAACAATGCCTATGTAGCATTCTTCTGTCTGAGGCTTTAGCTAGCTTCACTAATTTCA
CCATTAAGCAACCTCCAAAGTGGACACTGTATCGTTTCTTGATGCTGGTTCTTTCCCTCCCCTCACAGCA
GAGTATACACCCAC

>non-ORI-57

TCAAAATCCATGATTCTACAAATCTGTTTCAGTCAGAACGTCAGCATCTGCTGAGAGCCCCATGAGGAAG
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TGGGCACTTCTCAGGAGCCAAGCAGGCTGTGCTGTCAAAAGTGGGGGCCACGGAGGAGGCCACTGTATG
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>non-ORI-58

TGAAAATGGGGGCAAGAGAGCGGGGATCGCGTCTACCCGCCGTGTCGTCTCTGGTGAAGAGGGGA
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GGGGATAGAGCGGAAAACCTTCTGGGGACTTGAGAGCGTCTGGAAATGGCCCCTGTGATTTGTGCGCCG
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>non-ORI-59

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CAAAGGGGAGGAGCTGGGCAAAGATCAGGGCGTGGCCTGGGGTGGAGGAGGGGAAGACACAATCTGG
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>non-ORI-60

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>non-ORI-61

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 TAGGAATTTCCGGGCAGTGGGAAGCATTGGGGGCATCCAAGAGAAATGGTGGGTCCGTGGGCATAGCA
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>non-ORI-62

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>non-ORI-63

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>non-ORI-64

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>non-ORI-65

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 GTGTCGGCAGAGGTGGTCGCTGG

>non-ORI-66

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>non-ORI-67

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 GCTCAGTTTTCCCTCCCTGCGTGTCCCAGCGAGCTCGCTAAGGGAGACGTGGCGAGCGCAACGGTGG
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>non-ORI-68

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>non-ORI-69

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>non-ORI-70

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>non-ORI-71

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>non-ORI-72

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>non-ORI-73

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>non-ORI-74

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 GTGAAATGGGATGCTCTGGGCTCAGGTACAAACAAGGGTGTTTAGAAACGCGGATCTCCAGGGCTCATG
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>non-ORI-75

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 GAGGAGAGAGAAGGTGGGGTGGGGAAGAGCAATTGGACATCATTTATATAATAACCTGACACCAAGT
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>non-ORI-76

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>non-ORI-77

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>non-ORI-78

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>non-ORI-79

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 GTTGTA AAAAGTGGTGAACGGGATAAAGTGAAGGTGAAGATAAGAAGTCAAAAAAGAGGTAAATTA
 AAAGCTTCATTCCACAGCTTTTATTCTATAAGAACATAAACATCGTCTTTTTCCACGCACAGCAGCAATACA
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>non-ORI-80

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>non-ORI-81

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>non-ORI-82

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>non-ORI-83

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>non-ORI-84

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>non-ORI-85

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>non-ORI-86

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>non-ORI-87

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>non-ORI-88

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>non-ORI-89

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>non-ORI-90

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>non-ORI-91

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>non-ORI-92

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>non-ORI-93

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>non-ORI-94

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>non-ORI-95

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>non-ORI-96

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>non-ORI-97

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>non-ORI-98

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>non-ORI-99

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>non-ORI-100

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>non-ORI-101

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>non-ORI-102

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>non-ORI-103

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>non-ORI-104

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>non-ORI-105

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>non-ORI-106

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CTTATTTTGGTA

>non-ORI-107

GTCTGGTTTGACAAGGCTAGAATTTAATCCTGCAGAAGACAGGAGAGGCCGGAGGAATCTGGCCTTGAG
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>non-ORI-108

GTGGAGTGCCACTGCAGTGGGCTGGCGAGGTGACCTCTGACACTATAGTGGAGCACATTCTGTCCTGGA
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CAAATGGGAATCCTAGTGCAGAACTTTTGTCTCCTGGGTGGGAAAATTCTTATTTTAACTATAACCAC
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CAGATAATCTTTCAAGG

>non-ORI-109

CTCAGGTATGACAAGCCATAACTTCCTTGGCAAAATGTCTGATGAAGACTTAGTGGTGAAAAATGACAAA
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AGATGGTTTATGGAGTAACTACTTTATTTTGTGATATTCAGAGTGACAGAGATAAGTGATCTAATATTC
CTGGGATTTTACTCAAGTCTAGGTCATTTTTTCACTTAGCAGGAAATTGAAGAGTGGTCACTATGCCAC
ATTTGCATAAGGATGTATAT

>non-ORI-110

AATACAGGAACCTTTAGGGAAGCTCCAGGCCAAAGAGCATCCGTGGGCTCTCGGAGCGTGCGTTCCGGA
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GGGATAAGGAGATTACTATGCATGGGATACAAGAATCCAGAGATGATTCTCAACTATTGCTTCGCTTC
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TAGGGAGGGGCCAGGCCTCTGCG

>non-ORI-111

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>non-ORI-112

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>non-ORI-113

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>non-ORI-114

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>non-ORI-115

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>non-ORI-116

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>non-ORI-117

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CAAAGACAGTGGAGCAAATTTGTGTTACCGATCCAAATTTTTCTAGCACACCATCGCTGCCTTTTTTCATC
CCATTTATTATATAACCATG

>non-ORI-118

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GGCGCTGAGGTACGGCGGTGCGGAGCGAGGGCGAGGTCCC GCCGGCGGCCAGGGCGGCGGCTCAC
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>non-ORI-119

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CTTGGGGGCGAGAGAGC

>non-ORI-120

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>non-ORI-121

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AGGAGTTTTCTCATCTTTTTTTTCCAATTATCTGCAGGCTTCAATGTAGAAACAGTGGAATATAAGAATC
TGTTTCACAGTCTGG

>non-ORI-122

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CAGAATCCTAAAGTTG

>non-ORI-123

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CTTACTTATATA

>non-ORI-124

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>non-ORI-125

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>non-ORI-126

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>non-ORI-127

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>non-ORI-128

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>non-ORI-129

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>non-ORI-130

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>non-ORI-131

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>non-ORI-132

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>non-ORI-133

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>non-ORI-134

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>non-ORI-135

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>non-ORI-136

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 GAGCACTGGAGCACGAGTCTCCTTAGGGGACTCACCTTCTTCTGTAAAGGGAAGGGACAGGGCTGG
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>non-ORI-137

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>non-ORI-138

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>non-ORI-139

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>non-ORI-140

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>non-ORI-141

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CCTGCTCTCGCCCTGCCCC

>non-ORI-142

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>non-ORI-143

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CACTTCACTGGTCACGTCTGATCTGACCTCAGACACTCCCTGTGTGGTACTAAGCTCTAATGACACTGCTGC
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>non-ORI-144

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>non-ORI-145

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>non-ORI-146

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>non-ORI-147

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>non-ORI-148

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>non-ORI-149

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>non-ORI-150

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>non-ORI-151

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>non-ORI-152

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 GGATGCTCATAGGCTGGGGCGGAGTTTTGTGTCCAGACTCGGGATACGAAGGAGAGGAACTAGGA
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 GAAGTGCGGAAATATACTCCTAG

>non-ORI-153

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>non-ORI-154

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 ATTAGAGTTGATGTGGGAGACAGGAAGTTGGGGTAGGGATGGTCACGCCATTTGGCAGATGGACACAC
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>non-ORI-155

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>non-ORI-156

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>non-ORI-157

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>non-ORI-158

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>non-ORI-159

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>non-ORI-160

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>non-ORI-161

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>non-ORI-162

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>non-ORI-163

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>non-ORI-164

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>non-ORI-165

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>non-ORI-166

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>non-ORI-167

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>non-ORI-168

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>non-ORI-169

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>non-ORI-170

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>non-ORI-171

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>non-ORI-172

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>non-ORI-173

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>non-ORI-174

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>non-ORI-175

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>non-ORI-176

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>non-ORI-177

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>non-ORI-178

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>non-ORI-179

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>non-ORI-180

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>non-ORI-181

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>non-ORI-182

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>non-ORI-183

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>non-ORI-184

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>non-ORI-185

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>non-ORI-186

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>non-ORI-187

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>non-ORI-188

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>non-ORI-189

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>non-ORI-190

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>non-ORI-191

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>non-ORI-192

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>non-ORI-193

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>non-ORI-194

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>non-ORI-195

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>non-ORI-196

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>non-ORI-197

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>non-ORI-198

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>non-ORI-199

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>non-ORI-200

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>non-ORI-201

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>non-ORI-202

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>non-ORI-203

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>non-ORI-204

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>non-ORI-205

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>non-ORI-206

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>non-ORI-207

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>non-ORI-208

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>non-ORI-209

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>non-ORI-210

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>non-ORI-211

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>non-ORI-212

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TGGGGACAGGGTGGGGTGGGGGCCTGGCTCTGTTATTTACCGTGTATCATATGTAATATCGACAGAA
ACTTCAATAAATTTATTTCAAACACGTCTCCGCCTGCCGGAGGGAAGGGATTGGATAGAGGGGGCTTA
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>non-ORI-213

AGAGGAGAACCTGGGAGCTATAGCGGTGGAGCAAGAGGAAGTGAGTCAAGGGAATTCTATATGATGAG
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>non-ORI-214

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GCGGCCCTACACCACCTGGGGGATGGAGTTTCGACCAGCCGGGGTGGATTAGACCAGCAGAGGTGAG
GCCTGGGCCAGCTAAGAGTGGGCCGAGCCCTCTGGGTGGAGCTTAGACCAGCAGGGAAGCGCCTAG
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>non-ORI-215

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 GAATTCAGCGAGGCCAGTCCTTCTGAGCCCCAGCCAGGGCTCTGTTCTTCTCCTTCTGTGGATGCCG
 GGGTCTACTGCCTCTTGTAGACCCGGATTGAATTCGACCTCCCCTGGGAGCTCCCGGGACCCAGG
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>non-ORI-216

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>non-ORI-217

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>non-ORI-218

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>non-ORI-219

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 CCTCGTTTTTCAAACCTTTCATACCCTTGGGAGAGTGTCCAGCACCCCAAGCTCCCCTCTCCGCCAAACCA
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>non-ORI-220

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>non-ORI-221

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>non-ORI-222

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>non-ORI-223

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>non-ORI-224

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>non-ORI-225

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 CCTTCCCCTCCAAAACCCACATCCCCTTGTCCCTAGGGTCCCAGTACCTTAGCCTGATTTTCTGCTTCCAGA
 TCTGAGTATTGATGCCATGGATGTGGCCGGAGAACAGCAGCTGGATGTGGAACACAACCTGTTCAAGCA
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>non-ORI-226

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>non-ORI-227

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>non-ORI-228

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>non-ORI-229

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 TTTGAGGAACTAGCTGCCACTGGCTTCTTCTAAGTTTTGACGAAGAACAATTTATGTCTTCCCAGAGCTC
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>non-ORI-238

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>non-ORI-239

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 GCCTTTTTCTAATCCCCTCAATTCAGAAATGGAGCCCCAGAAAGTTGAAGTTAGTAAACCAGGGCTACCCA
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 CTATTCACGTAGATTTTTGT

>non-ORI-240

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>non-ORI-241

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>non-ORI-242

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>non-ORI-243

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>non-ORI-244

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>non-ORI-245

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>non-ORI-246

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>non-ORI-247

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 GGCTGTAGAGCAGTGGCCTCTCACTGACCACTTCTCACTGATGTCAAAGCTCAGCAAGGTCATGAGCTTA
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>non-ORI-248

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>non-ORI-249

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>non-ORI-250

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>non-ORI-251

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>non-ORI-252

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>non-ORI-253

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>non-ORI-254

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>non-ORI-255

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>non-ORI-256

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>non-ORI-257

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>non-ORI-258

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>non-ORI-259

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>non-ORI-260

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>non-ORI-261

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>non-ORI-262

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>non-ORI-263

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>non-ORI-264

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>non-ORI-265

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>non-ORI-266

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>non-ORI-267

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>non-ORI-268

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>non-ORI-269

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>non-ORI-270

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>non-ORI-271

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>non-ORI-272

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 CAATAAGCGTTTCATTGCACCCACATTTTCTCAATATCACTATCTTCGGCAGAAGCAGCAAAGTTGCCACC
 CTGGAGCCTGACGTTGCCCCAGCTGAGGGCCTTGGTTTTCAGAGGCCTACTCAATGCATTATTTTCATCCGA
 GCCTGCCAGTGCTCACACTCTCATAGAGGCGGGGAATAAACTGACAACAAATCGCAACCCTGGCTTTCG
 CAGAACTCTGGCGGGGG

>non-ORI-273

AGAGCAAAAACACAGAGTCTCCGGGATTCTCACTTGGGAAACGTCAGAGAGTCATTTTCGTGAATGACA
 GAAATGACATGGGAAAGATGAGCCAGCTGGCGTCTGTGGCAGGCAGATGGGCTTACTAGATGTGGCTG
 CACACACTTGCTTCTAGAATGCCAGAGATGCACGCTGGAAAGCCATCTCAGGGACTCCCTGGGAGAATGA
 GGCTGGACGAGATGGCTCTAGATGGAGCTAGAGTCACGGCTGTCTGGGTGAAGCTGGAGGCACAGGTG

GTGGCCAGAGAGAGGAGGCGCGG

>non-ORI-274

GCTTCTGGGGCCAGGCAGCCCTGTGCAACCCGAGCTGCTCCCCTGTCCCCGCTGTCCCACCGCCCTCCCTGG
ACGCCTGCTACCCACCATCAAACACCGCCTCGTGCCGGCCCCGCGCACCTCCC GCCCGTGGGCCCCACG
CTTCAGGCGCTACCTGGAGGGCATGGCTCCTACCCGTGGGCACTCGCCTTACCCTTGGAGCCCGGCCCTTC
CCCGGGCAGCCGGGAGAGGTTCTACCACTTACGAGGCCTCCTCGCCCTGCCAGGCCGAGGTCAGGGTT
AGAGAAGCTGGGTCGTTA

>non-ORI-275

CTCCAGCGCCCACAGGGACTGCAGGGCTCGTGTCTAGGCCAATCACAAGGATCCTGCGTGTCTGAGTCT
GGGGGAGCCAAGCGCACCCAGGTGAAAGGCCGAGGCCAAGGCCACCTTCTCCAAGGAGCCACCCAC
AGTCACAGCCCCTGGTGTCTGTCCCAAGCCGGGATTGTTTCTGGGGTGGGGGCAACAGGTCGTTGCAG
GTGTTGGCTGGGCGCCTACGTGAGGCAGGGCCCCGGGACGGGACTGCAGGGCTCCGAGCCCTGGGATG
AACCTGACTGCCATGGATCAGGCG

>non-ORI-276

ATCTTGTGGGGGGAGGGGATTAACCAAAGGCCACCTGACTTTGTTTTGTGGACACACAATAAAAGCC
CCGTTTATTTGTAATGCGTTGGCTCTTCTGGAGGAGAGGGTTGGGCTCCCATGGCAAGGGCCTCTGCGT
CTTGGGGCTCCAGGATTGCAATCCGGCTTTGTTGGGTCCGCATTTTTGCTTAGTCTGGGGATAGGAATCA
AATGTTACCCAGAGATGTTTGTGTTTTGTTGGGAGTTTTATTCCCTAACTCATTCCCCAAAGCACGTGTAA
CTGCTTATACATATAAT

>non-ORI-277

CTGAGCACTCAAGTCCGAAGATGTCCATACACAGCGGCCCTCACAGCGGTCCGCCCTTCCAGGGTAT
GTGCCCTTCCAGCAGGGGCTCTGGGGCGTGCAGGGAGAGGCAGTGTGGTGAGTCTGCTTGGAGGTGGG
GAGTGTATGCCACAGGTAGGCTGCCAGGAGGCCAGCATAGGGGAAGCATGAGGCACAGAACCCTGT
GGTGTGACTATTTGGAGTGGCTGACTCTGGGGGAGGGCTAGGATGAGCACTCAAGTCTGCTCCCAT
TCCAGGGGCAGCTTTCATCTCG

>non-ORI-278

TGATCCTTTTGGGGAGACTCACTCATCAGGACTCGGGGCTCCAGGGGAGAGCAGGCTCCTGCCTGGGGA
ACTGGGGAAGCCTGGCCAGAGGAGCCTTGAACACCAAGTCTCATGCCCTGGCCGCACTGTCTGAGCCG
GGGTGCCAGCAAGCAGAAGGTGTATTTCTCTGCCAGCCACCTTCTTGGGAGACCACTGGTCAGCGAGG
GCTTGACATGGTACCAAGTGGGTTGGGGCTGGGGCCAAAGAGAGGCCTCCTGGGAAGCTGTTGATGACA
TTCTGGGGCCTGGAGGGAGGAAA

>non-ORI-279

CGTGCGGGGCCAAACAGCTCGGGGCCGGGGCTCCGGCAGCCCGGGGTCCGGCTCGGCCTGTGGGGG
TCAGGCCCTATCCCTGCCGTCGGCGCCGGCCTGCCGACTCCTTGTGCCCCGCATGGTGGGGACGCCAA
CCCAAGACCAACACCCTGCCAAAGAGGACCCTTTGTCGCAGGGGAGCGGCCCTCGGAGGATCAACGC
TGTACTTCCCTCCCCTAAGGGCTCCGCGAGTCCGCGAGGGGTGCCCTGATGGGGCCCGGGCAAACCG
GACCAGCAGCACGGTGGGGGGTGT

>non-ORI-280

TGGTAGAGAGGGCAGAACCAGGCTGGGGGAGGCCCTGACACCACCCACCTGAAGAAGGGCTCACTCTG
TTTGCGGATGTCAGCCACTGTGAGGCGGGAACGGGCATAGCCACGATGAAGGTGTTTTCGGGCAGAAG
GCCATCCCGAACAGCCACCTGAGGGCAGGGCACAGCTGTAACCAGTGCGGGCAGGGCAGGACCAGGC
CTGTCCCTGGCGGGAGGTACAGGGGCAAGTGGTGGGACACACTTACCAGATGGTGGGGTAGATCTTCTT
CTTGGCCAGGTCACCCTGTGGCAGA

>non-ORI-281

CTTCCGCCGGCAGCGTGGCCACGCCTCCTCTGGGCTGTCCCTCGGCTCCTGGGCGGGGCCTTCTGCCGCG
C
CACTCCCCGGGAACCCTCGCCTGTTGCGGGTCAAGCCGGCCCTATTGGGCAGTCTCTTCTTGATTCT
C
CCCCGGAGAGGGCGGGGCGGCCGAGCGCCCCGAGGCTAGACGCCCGTCCGAGAGACGAGGGGGC
G
GTGTAGGCGGTGACGCCCTGCAAAGTGGCCGGCGTGCTTATCATTACCGAGCTCCGCGGGCCTGCAGA
G
GCCTGGCGGACTCAGACTTCTCT

>non-ORI-282

TCACGCGGTGTCTGGGGCCTAACCACCCTGGGGTGTGCTCTCCAGTGGAGCTACCCAGCCTTCCGGCG
C
CGCCCCGGCGCAGAAGCCGAAGACATTCTGTCCCCGTTCTCGGAAGCGGTCTGGCTCTTTGTCCCT
T
TGGACGTTTCTCAAATGCCTCGTGGCGTCATTCTGTGTACAAGGCACCTCCCCAACTGCTTTATTGTTGG
T
TTTTGAAAACTAGCACATATGGGATGGTACTTAGGAATAGCCTTCTGTTTAGTCGGCATAGTCAAAGATT
C
CGTGTAATTCGCAGT