**Course: Advanced Bioinformatics**

**Module title: Central Dogma in BioJava**

**Module no. : 194**

Transcription

In BioJava DNA sequences and RNA sequences are from different Alphabets

//make a DNA SymbolList

SymbolList dna = DNATools.createDNA("atgccgaatcgtaa");

//convert it to RNA

SymbolList rna = DNATools.toRNA(dna);

//just to prove it worked

System.out.println(rna.seqString()); //augccgaaucguaa

//biological transcription (ie copy and reverse strand)

rna = DNATools.transcribeToRNA(dna); //5’ atgccgaatcgtaa 3’

System.out.println(rna.seqString()); //5’ uuacgauucggcau 3’

Reverse Complement

**import** org.biojava.bio.symbol.\*;  
 **import** org.biojava.bio.seq.\*;  
   
 **public** **class** ReverseCompiment {  
   **public** **static** **void** main(String[] args) **throws** Exception{  
     SymbolList forward = DNATools.createDNA("atcgctagcgatcg");  
   
     //two step  
     SymbolList reverse = SymbolListViews.reverse(forward);  
     SymbolList revc1 = DNATools.complement(reverse);  
   
     //one step  
     SymbolList revc2 = DNATools.reverseComplement(forward);  
   
     //test for equivalence  
     System.out.println(revc1.equals(revc2));  
   }  
 }

Translation

* RNATools contains the “Universal” RNA to Protein TranslationTable.
* Standard procedure is transcribe DNA to RNA and then translate.

Translation Example

* **import** org.biojava.bio.symbol.\*;  
   **import** org.biojava.bio.seq.\*;  
     
   **public** **class** Translate {  
     
     **public** **static** **void** main(String[] args) {  
       **try** {  
         //create a DNA SymbolList  
         SymbolList symL = DNATools.createDNA("atggccattgaatga");  
     
         //transcribe to RNA  
         symL = RNATools.toRNA(symL);  
     
         //translate to protein  
         symL = RNATools.translate(symL);  
     
         //prove that it worked  
         System.out.println(symL.seqString());  
       }  
       **catch** (Exception ex) {  
        ex.printStackTrace()    
       }

   }

}