

## A EXTRACTIVE SUMMARIZATION ON PUBMED

TextRank produces a purely extractive summary. But we see that it is able to identify the relevant sentences. The content overlap between the reference and generated extractive summary is adequate.

*Reference Summary.* **to find out the different ovarian activity and follicle recruitment with mirnamediated posttranscriptional regulation, the small rnas expressed pattern in the ovarian tissues of multiple and uniparous anhui white goats during follicular phase was analyzed using solexa sequencing data.** <dig> mirnas coexpressed, <dig> and <dig> mirnas specifically expressed **in the ovaries of multiple and uniparous goats during follicular phase** were identified. in the present study, the different expression of mirnas in the ovaries of multiple and uniparous goats during follicular phase were characterized and investigated using deep sequencing technology. rt-pcr was applied to detect the expression level of <dig> randomly selected mirnas in multiple and uniparous hircine ovaries, and the results were consistent with the solexa sequencing data. micrnas play critical roles in almost all ovarian biological processes, including folliculogenesis, follicle development, follicle atresia, luteal development and regression. the result will help to further understand the role of mirnas in kidding rate regulation and also may help to identify mirnas which could be potentially used to increase hircine ovulation rate and kidding rate in the future. the <dig> most highly expressed mirnas in the multiple library were also the highest expressed in the uniparous library, and there were no significantly different between each other. **the highest specific expressed mirna in the multiple library was mir29c, and the one in the uniparous library was mir<dig>** <dig> novel mirnas were predicted in total. superior kidding rate is an important economic trait in production of meat goat, and ovulation rate is the precondition of kidding rate. go annotation and kegg pathway analyses were implemented on target genes of all mirna in two libraries.

*Extracted Summary.* **in order to identify differentially expressed mirna during follicular phase in the ovaries of multiple and uniparous anhui white goats, two small rna libraries were constructed by solexa sequencing.** for all mirnas target genes of multiple and uniparous goats in the ovaries during follicular phase, there were <dig> and <dig> target genes mapped to the go terms of cellular component. the expression levels of <dig> randomly selected mirnas were verified in the ovaries of multiple and uniparous goats during follicular phase using rt-pcr. in this study, we sequenced the small rnas **in the ovarian tissues of multiple and uniparous anhui white goats during follicular phase** by illumina solexa technology, then analyzed the differentially expressed mirnas, predicted novel mirnas, and made go enrichment and kegg pathway analysis of target genes in two mirna libraries. in ovaries between multiple and uniparous goats of follicular phase, <dig> novel mirnas were predicted in total, which is distinctly more than the amount predicted in our previous study implemented by our team workers, zhang et al. **the highest specific expressed mirna in multiple library was mir29c, and the one in uniparous library was mir<dig>** as aligning the clean reads to the mirna precursor/mature mirnas of all animals in the mirbase <dig>

database, and obtained mirna with no specified species. rt-pcr was carried out to analyze the expression of <dig> randomly selected mirnas in multiple and uniparous hircine ovaries during follicular phase, and the results were consistent with the solexa sequencing data.

## B ATTENTION VISUALIZATION FOR SUMPUBMED

The example below shows a reference summary that originally accompanied the document, along with the system generated summary. We can visualize the attention projection by highlighting the respective words in yellow on the source document while producing a word. Figures 2 and 3 show the words in green with high generation probability, i.e.  $p_{gen} > 0.5$  (not copied), non marked words have  $p_{gen} < 0.5$  (mostly copied).

*Observations about attention visualization .* While producing a word in the output, we can visualize the respective words in the source document on which the network is focussing. The darker the green highlight over a word in the summary, the higher is the  $p_{gen}$  prob- ability. E.g., there is a chance that  $p_{gen}$  is high whenever a new sentence is started after a period (.). The model generally focuses on two or three words at a time. There is a high chance that the summary starts with a noun phrase or a noun. For example, we can see in Figure 2 that the summary starts with name (noun) 'kevin pietersen'.

## C SUMMARIZATION EAMPLE ON CNN/DAILYMAIL DATASET

Here also we see factual redundancy and repetitiveness in the generated summaries with pointer-generation which is removed by applying coverage.

### C.1 CNN/DailyMail Dataset

In this example Factual Redundancy is shown with the fact that is being repeated presented in bold:

*Reference Summary.* maricopa county sheriff 's office in arizona says robert bates never trained with them. " he met every requirement , and all he did was give of himself, "his attorney says. tulsa world newspaper: three supervisors who refused to sign forged records on robert bates were reassigned.

*Summary from seq2seq.* some supervisors at the tulsa county sheriff's office were told to forge reserve deputy robert bates ' training records. some supervisors at the tulsa county sheriff's office were told to forge reserve deputy robert bates' training records, and three who refused were reassigned to less desirable duties. **some supervisors at the tulsa county sheriff 's office were told to forge reserve deputy robert bates ' training records.**

*Summary from seq2seq with coverage.* some supervisors at the tulsa county sheriff 's office were told to forge reserve deputy robert bates ' training records . the volunteer deputy 's records had been falsified emerged " almost immediately " from multiple sources after bates killed eric harris on april 2 . bates claims he meant to use his taser but accidentally fired his handgun at harris instead .

## Article

it 's the picture some england cricket fans have been waiting to see and others have been equally dreading : kevin pietersen back at surrey . the 34-year-old returned to nets on monday for the first time since re-signing for the county last month . he arrived early for the session at the oval - tweeting a picture of the pitch with the caption : ' in the office today . # oval ' - before team-mates such as gareth batty and jade dernbach followed him in . kevin pietersen is pictured leaving the oval for the first time since resigning for surrey last month . pietersen returned to nets at surrey on monday and left the oval after training finished just before 2pm . pietersen was pictured driving away from the oval in his expensive telsa sports car . pietersen managed a wry smile as he drove away after training on monday afternoon . pietersen was later pictured leaving the ground just before 2pm and is expected to step-up his county rehabilitation with a three-day warm-up against oxford mccu on april 12 . ultimately , pietersen is hoping to impress enough for surrey to earn a re-call to the england side - possibly for this summer 's ashes rematch - having been sacked by the national side in 2014 . england left for the west indies for their upcoming test series on thursday , with coach peter moores leaving kp in no doubt that he still has a lot to prove - despite incoming england and wales cricket board chairman colin graves appearing to extended an olive branch to the exiled batsman . asked at gatwick about pietersen 's situation , moores said : ' from my point of view , kevin is n't on the radar . '

## Reference summary

kevin pietersen took part in a net session at the oval on monday . he is expected to play in three-day game against oxford mccu on april 12 . pietersen has returned to county game to boost chances of england recall .

## Generated summary (highlighted = high generation probability)

kevin pietersen returned to nets on monday for the first time since resigning for surrey last month . he returned to nets at surrey on monday and left the oval after training on monday . pietersen is hoping to impress enough for surrey to earn a re-call to the england side .

**Figure 2: Attention Probability for decoding on DUC 2001 dataset example, showing the summary is more inclined to an extractive nature. Attention corresponding to the word 'pietersen' present in the generated summary is shown.**

## Article

in line with these results , pet studies using transient reduction of tinnitus by lidocaine also revealed significantly increased rcbf in temporoparietal cortical activity during tinnitus perception . regarding cortical excitability measures , significantly enhanced intracortical facilitation of the motor cortex , was found in tinnitus patients using transcranial magnetic stimulation . single sessions of rTMS were applied at high frequencies and resulted in a short-lasting but significant improvement , whereas low frequencies have been used for approximately 5 - or 10-day treatment trials and showed a long-lasting reduction in symptoms . comparison of the effect of high - and low-frequency rTMS showed that brief high frequency rTMS has no effect , whereas prolonged low frequency rTMS has a significant effect on tinnitus . , chronic tinnitus sufferers showed surprisingly , that both the high and low-frequency rTMS applications were effective . the largest double-blind parallel study compared the effects of different frequencies of rTMS -RRB- , given daily over the left temporoparietal cortex for weeks . preconditioning the temporal cortex with high-frequency rTMS before low-frequency stimulation did not result in more pronounced effects . recently a specific rTMS paradigm , namely theta-burst stimulation , was applied . the non-parametric Friedman anovas , calculated for all the patients for every time point separately , also showed no significant effect of stimulation . wilcoxon matched pairs tests calculated for each tbs protocol separately , resulted in a significant difference only in case of cTBS between baseline and the time point immediately after the stimulation fig in the present study we could not find any significantly different effect on tinnitus perception for the different types of tbs applied to the inferior temporal cortex , either at the lower intensities of 80 % amT , nor at the higher intensities of 80 % rMT . the intensity of the stimulation also did not significantly differ between the two groups that may indicate that the observed slight effects are not intensity dependent , and that the loudness of the noise evoked by the stimulation did not influence the patients . the first possible explanation is that tbs had no effect in our study over the temporal cortex because it could not reach the tinnitus-related areas or was not sufficient to induce excitability changes in these areas . we chose to stimulate all our patients on the left side of the head , over the t<sub>1</sub>-eeg-electrode position , irrespective of their tinnitus - affected side , as the primary studies reported positive effects on tinnitus after rTMS over t or very close to it . however , even this enhanced stimulation intensity did not result in better effects on tinnitus perception . stimulation of the temporal cortex with tbs at rMT or above , or using a higher number of impulses was regarded as unsafe by our own safety guidelines , and due to the need for clear safety limits for tbs , safety limits of conventional rTMS should also be applied . if tbs applied over the left inferior temporal cortex was actually not effective on tinnitus , we should consider that all of our non-significant but not negligible observed effects were caused by the placebo effect . it is important to mention that the placebo effect is high in most of the clinical rTMS studies , regardless of the paradigm used . still , with the exception of huang and colleagues , who published the first series of tbs experiments on the motor cortex and stated that imTBS has no effect , there has been no other study , which has confirmed this . in a recent study we found , that imTBS applied over the primary somatosensory cortex has a significant effect on the n component of the laser-evoked potential , but not the sham protocol . therefore , another possible explanation as to why tbs had no significant effect on tinnitus in our study may be that there was no adequate placebo condition ; which is another limitation of our study . the results of the experiments using single trains of tbs suggest that in the human motor cortex tbs produces a mixture of facilitatory and inhibitory effects on synaptic transmission . it is possible that the difference in effectiveness observed between tbs protocols on motor and sensory cortices could be due to differences in the physiological and functional states of the stimulated cortex . furthermore , several studies have shown that both low - and high-frequency rTMS reduce tinnitus indicating that tms effects on motor cortex excitability are different from tms effects on tinnitus perception . one session of rTMS has only very short-lasting effects on tinnitus perception . furthermore women experience greater suppression of their tinnitus with burst stimulation than men and since we had only two women , it could influence our results . our study design and results do not allow us to draw conclusion about the neuronal mechanisms of tms on the temporal cortex , but may show that the effects of tms on tinnitus are not directly mediated by tms induced modulation of excitability in the stimulated cortical area . it is important to note that in previous studies using high-frequency suprathreshold rTMS , the improvement in tinnitus was observed by about 42 - 68 % of the stimulated patients . according to the recent results of rTMS applied in alpha - , beta - , and theta-bursts , new types of burst stimulation protocols may be more effective in tinnitus .

## Reference summary

although half of the patients reported a slight attenuation of tinnitus perception , group analysis resulted in no significant difference when comparing the three specific types of tbs . in addition there was no significant difference when comparing the responder and !!non-responder!! groups regarding their !!anamnesitic!! and !!audiological data . repetitive transcranial magnetic stimulation over the temporoparietal cortex was recently introduced to modulate tinnitus perception . changes in subjective tinnitus perception were measured with a numerical rating scale . patients received pulses of continuous tbs , intermittent tbs and intermediate tbs over left inferior temporal cortex with an intensity of 80 % of the individual active or resting motor threshold . in the current study , the effect of theta-burst stimulation , a novel rTMS paradigm was investigated in chronic tinnitus . cortical excitability changes as well as imbalances in excitatory and inhibitory circuits play a distinct pathophysiological role in chronic tinnitus . tbs applied to inferior temporal cortex appeared to be safe . twenty patients with chronic tinnitus completed the study . the tq score correlated significantly with the vas , lower loudness indicating less tinnitus distress .

## Generated summary (highlighted = high generation probability)

the effect of the second month of the indirect brain barrier for the medial edge of the medial edge confirms the importance of medial prefrontal cortex and evoked potentials . the intensity of tms induced modulation of tinnitus - and lidocaine motion were observed in patients with painful subjective development . we investigated the effects of all three tbs paradigms in a randomized , single-blinded cross-over design . the aim of this study was to investigate the neuronal mechanisms of tms on the temporal cortex of tinnitus perception in patients with chronic tinnitus perception . in this study , we investigated the effects of the temporal cortex with high-frequency suprathreshold rTMS on motor cortex excitability and functional states of the stimulated cortical area tbs at hz over the left inferior temporal cortex and compared to the inferior frontal cortex . and then subjected to the placebo group . the placebo effect was evaluated using single trains of tbs , using high-frequency suprathreshold rTMS as a mixture of the n component of the stimulated cortical area . the results of the present study suggest that tms effects on tinnitus after low-frequency stimulation than men did not differ in the physiological and functional states of the stimulated cortical area . in the present study , we investigated the effects of rTMS on the left side of the somatosensory cortex and over the left inferior frontal gyrus . we found that the observed effects of rTMS resulted in a significant

**Figure 3: Attention Probability for decoding on a PubMed example where the attention corresponding to word 'present' in the generated summary is shown.**

---

## Front part of the example document 'test.txt'

---

Common Attribution Licence ( ), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

### Background

Recently there has been increased interest in pancreatic cholesterol esterase due to correlation between enzymatic activity in vivo and absorption of dietary cholesterol.

### Results

Our analysis indicates that the current set of nearest neighbor energy parameters in conjunction with the Mfold folding algorithm are unable to consistently and reliably predict an RNA's correct secondary structure.

### Conclusion

We are the first to report that the acyl chain binding site of cholesterol esterase shows stereoselectivity for the four diastereomers of 1.

---

---

## Body part of the example document 'test.txt'

---

### Background

There has been increased interest in pancreatic cholesterol esterase (CEase, EC 3.1.1.13) due to correlation between enzymatic activity in vivo and absorption of dietary cholesterol [1,2]. Figure 2 Structures of the four diastereomers of carbamates 1 and two atropisomers of 2.

### Results

The inhibition data for CEase by the four diastereomers of 1 and the two enantiomers of 2 are summarized (Table 1). The stereochemical preference of CEase for the binaphthyl moiety of 1 ( $R > S$ , ca. 10 times) is the same as that for 2 [20,22]. The stereoselectivity of CEase for the  $\alpha$ -methylbenzyl moiety of 1 is also the R-form (2-3 times over S-form).

Table 1. Inhibition constants for CEase-catalyzed hydrolysis of PNPB in the presence of the four diastereomers of 1 and the two enantiomers of 2

Inhibitor	K <sub>i</sub> ( $\mu$ M)	K <sub>2</sub> (10-3s-1)	K <sub>i</sub> (10 <sup>3</sup> M-1s-1)
(1R, $\alpha$ R) - 1	0.20 $\pm$ 0.01	2.0 $\pm$ 0.2	10.0 $\pm$ 1
(1R, $\alpha$ S) - 1	0.50 $\pm$ 0.03	2.0 $\pm$ 0.2	4.0 $\pm$ 0.4

### Conclusion

The enzyme stereospecificity toward the 1, 1'-bi-naphthyl moiety of the inhibitors is the R-form and is the same as that for 2.

### Acknowledgement

The authors thanked the National Science Council of Taiwan for financial support.

## References

Hui Dy Molecular biology of enzymes involved with cholesterol esterase hydrolysis in mammalian tissues Biochim Biophys Acta 1996 1303 114 8816847

Lopez-Candales A Bosner MS Spilburg CA Language LG Cholesterol transport function of pancreatic cholesterol esterase: directed sterol uptake and esterification in Enterocytes Biochemistry 1993 32 12085 12089 8218286 10.1021/bi00096a019

Brockerhoff H Jensen RG Cholesterol esterase esterase Lipolytic Enzymes 1974 New York: Academic Press

---

## XML format for example document 'test.txt'

---

```
<mydataset>
  <document>
    <id> 1 </id>
    <paper_name> test.txt </paper_name>
    <abstract>
      <background>
        Recently, there has been increased interest in pancreatic
        cholesterol esterase due to correlation between enzymatic
        activity in vivo and absorption of dietary cholesterol.
      </background>
      <results>
        Our analysis indicates that the current set of nearest neighbour
        energy parameters in conjunction with the mfold folding
        algorithm are unable to consistently and reliably predict an rna's
        correct secondary structure.
      </results>
      <conclusions>
        We are first to report the acyl chain binding of cholesterol
        esterase due to correlation between enzymatic activity in vivo
        and absorption of dietary cholesterol <cit>.
      </conclusion>
    </abstract>
    <text>
      <background>
        Recently, there has been increased interest in pancreatic
        cholesterol esterase due to correlation between enzymatic
        activity in vivo and absorption of dietary cholesterol <cit>.
      </background>
      <results>
        The inhibition data for cease by the four diastereomers of <dig>
        and the two enantiomers of <dig> are summarized. The
        stereochemical preference of cease for the binaphthyl moiety of
        <dig> is the same as that for <dig> <cit> . the stereoselectivity of
        cease for the \xce\b1-methylbenzyl moiety of <dig> is laos the
        r-form.
      </results>
```

<conclusions>

The enzyme stereospecificity toward the <dig> 1\'-bi-2-naphthyl moiety of the inhibitors is the r-forms and is the same as that for the <dig>.

</conclusions>

</text>

</document>

</mydataset>

---